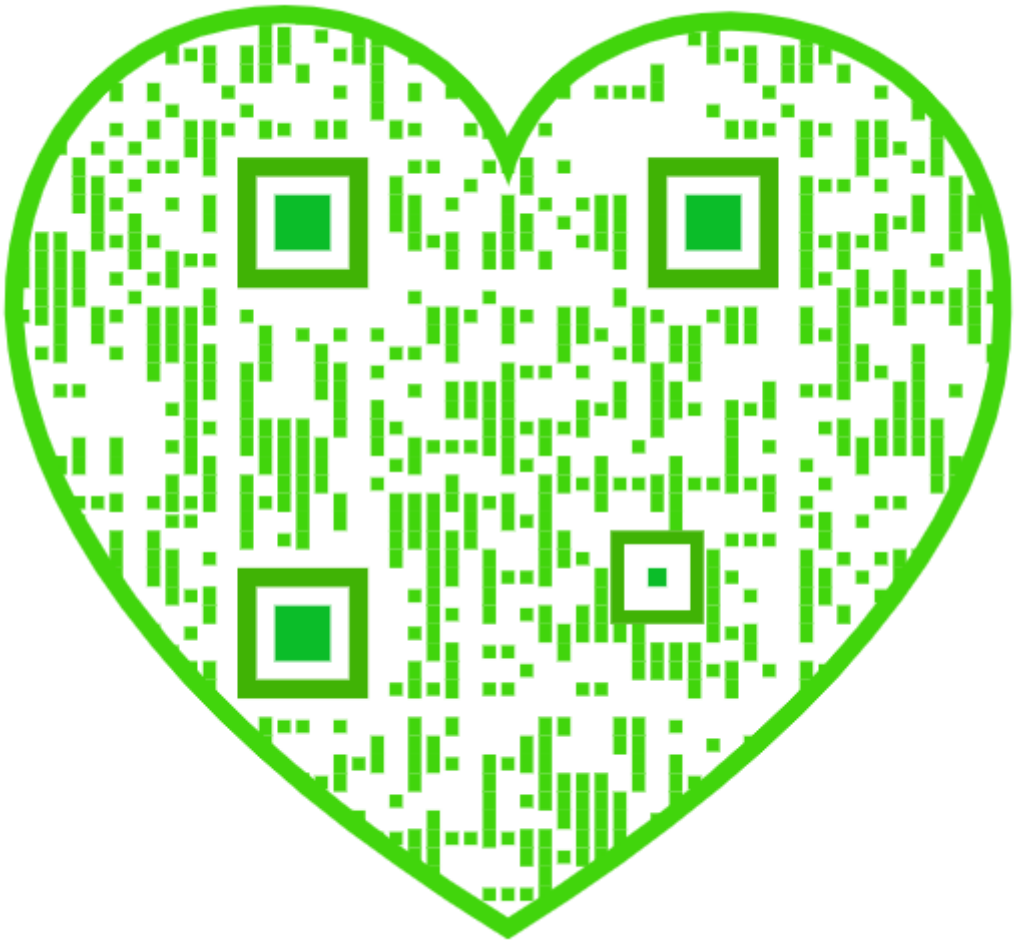
THE PRACTICAL STOCK DOCTOR



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THE THRIFTY FARMER.

THE

PRACTICAL STOCK DOCTOR

Compiled from the most successful Veterinarians
in the world, and also containing
over

Two Hundred Tried and Tested Remedies and Receipts

of many of the most successful
Farmers and Stock Owners in the United States
and Canada.

Edited by
DR. GEO. A. WATERMAN,
Professor of Veterinary Science,
Michigan State Agricultural College.

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INTRODUCTION

IN editing this work, it has not been with the intention of giving the stockman something that will take the place of the veterinarian; no book can do that; no amount of reading can take the place of his experience. The object has been to give those who wish to better acquaint themselves with the diseases of animals, an opportunity to do so; and especially is it for the stockman who is not within reach of a qualified veterinarian. There are many such, even in the richest, most thrifty parts of our country, and there are others so far from a veterinarian, that it would require many hours of valuable time to get him.

It has been the endeavor throughout the text, to use such expressions as can be understood by those who have not had a scientific training. A plain description of the anatomy of animals has been given for the benefit of those who may desire to better understand their structure, and points have been collected with reference to the training of the horse, which may prove of benefit to the inexperienced along that line.

Nothing new is claimed for the work, unless it be that an effort has been made to make the treatment of the diseases discussed a strong feature, by telling in a simple, plain way, just what to do, and how to do it; what medicines to use, how to use them, and how often to repeat them. So often, when asked by the farmer to recommend to him a book treating of the diseases of animals, have I felt that the works intended for him do not give the treatment of the diseases in such a way, that he may know what drug or drugs to use and how often to use them, that in this work I have tried to make the treatment especially plain.

While the work is in part a compilation, as editor I have woven into it, especially with reference to the treatments, the lectures as I have given them to our college students.

The diseases of the different animals have been treated under different departments, and while such an arrangement has caused some repeating, it has been so arranged, because it will be easier to follow the instructions. While nearly all the diseases of animals have been touched upon, especial attention has been given to the more common ones.

In giving this work to the public, I trust that it may prove a benefit to those into whose hands it may fall.

GEO. A WATERMAN.

AGRICULTURAL COLLEGE, MICHIGAN,
June 1, 1904.

HISTORY OF THE HORSE

FROM earliest ages the horse has been the friend and companion of man. Prized for his beauty, loved for his docility, and valued for his strength, he has ever been regarded as the highest in value and importance of all domesticated animals. In the remotest ages, as far back as authentic history discloses anything of the life and pursuits of man, we find that the horse occupied a prominent position in his service. Painters have pictured on their canvas the majesty and grace of the spirited animal. Poets have celebrated his strength and beauty in their verses, and the inspired writers have introduced amongst their most glowing descriptions the horsemen and chariots which formed a chief feature in the pomp and magnificence of those early days.

In the most ancient hieroglyphics we find him present, and always so represented as to show that, even in the remote antiquity from which they date, he has been brought into complete and serviceable subjection. In the oldest Egyptian paintings the horse is seen only in the war chariot, and in the descriptions of the siege of Troy only the charioteer appears, from which it has been supposed that the first horses used by the Greeks were too small to be conveniently ridden. But in the painting in the palace of Nimrod at Nineveh, disinterred by Layard and supposed to be more than three thousand years old, horsemen are exhibited both in the chase and in war.

But farther back than even those distant times, in the ages where authentic history merges into the shadowy light, amidst which myth and fable mingle with the real, we find this noble animal figuring, but then exalted into a semi-human sphere. The Centaurs, who inhabited the passes of Mount Pelion and Ossa and the great plains of Thessaly in Upper Greece, were probably a race resembling in many respects the Tartars of this age, and are supposed to be the first who brought the horse into subjection

to man. They were fabled as being half horse and half man. They are represented as perfect horses in all respects below and behind the withers and the chest; there, at the intersection of the neck, began a human body, the hip joints articulating into the shoulders of the lower animal and the abdomen of the man passing gradually into the chest of the horse. Above this the human form was perfect, with the erect bearing, chest, shoulders, arms, neck and head of a complete man. They were reputed to be possessed of extraordinary mental as well as physical powers, and to be as superior to ordinary men in wisdom and art as they were in fleetness and strength. They were evidently a tribe of horsemen whom the ignorance and superstition of that early age elevated into a superior race, in the supposition that the horse and man were united in one. Everything points to them as being the first who succeeded in breaking and using the horse.

Coming down to the time of authentic history, we find the Parthians to have been among the most renowned for their skill in training and using the horse. Their feats of horsemanship in battle showed a complete mastery of the animal, which in their battle with the Romans rendered them so efficient as mounted archers.

Frequently in ancient paintings the mounted steed is represented without a bridle, and the Numidian cavalry are said to have guided and restrained their horses without it, an assertion by no means improbable, as a Comanche Indian of the present day will frequently jump on the back of a wild and untrained horse, and guide him by the simple expedient of covering with his hand the eye of the animal on the opposite side to that in which he wishes to direct him.

In sacred history the first mention of the horse is in the time of Joseph, when in Egypt, at which period the horse had been broken and subjected to the harness, thus corroborating the already mentioned records of the monuments. Thus we find that as civilization advances, and historic records multiply, that the use of the horse becomes more universal. Where the original country of the horse was matters little, except as an interesting fact, whether in Asia or on the soil of Africa, to which his near relations, the Zebra and the Quagga are certainly indigenous.

In modern times the horse has been so closely associated with man that he appears in every phase of society, and it is only when his numerous uses are considered that we realize how greatly the human family is his debtor. The knight of the days of chivalry would have been impossible but for the trusty steed which bore him so gallantly in the lists of the tourney and amid the deadlier strife of battle. Before the plow and at the harrow he has multiplied the productions of the earth a hundredfold beyond what human strength alone could have secured. Laboring before the loaded wagon, he has been the steady drudge of man. Harnessed to the elegant equipage or the humbler "cab," or bearing along the dusty highway the stage coach, he has performed a thousand offices indispensable to human comfort and advancement. It is not too much to claim for him that civilization itself would have been shorn of something of its fair proportions but for the valuable services rendered by this noble animal.

Yet, with all his acknowledged value, the horse has been too frequently the victim of neglect and cruelty; often ill-fed, poorly sheltered and harshly treated, until in many cases the innate nobleness of his nature has been obscured by vicious habits, contracted by the mismanagement and abuse to which he has been subjected and perpetuated by ignorance and prejudice. Naturally the horse is gentle and confiding; he is quick to perceive, and possesses an excellent memory, which qualities render him capable of being educated easily, and to an extent far greater than is generally supposed. Added to this he is capable of deep and lasting attachment.

What the horse may have been in his native state is not known, as none at present exist in that condition. The horses which at the present day are found in a wild state in Asia and America are known to be descendants of individuals formerly domesticated. They are generally smaller, yet stronger than the domesticated animal, with rougher coats, stronger limbs and larger heads. Even when adult, the wild horse is easily domesticated, and may be broken to any use without great difficulty, thus proving the natural gentleness and docility of his nature. They are captured by the lasso, bitted, mounted, and broken within an hour by the daring and skillful Gauchos.

The Arabians, long renowned for their attachment to the horse, early showed the extent to which intelligent training could develop his finer qualities, and render him the most docile and obedient of animals. Something in that country or its climate is especially suited to the development of the horse, and although introduced there long after his domestication in other eastern countries, he rapidly attained a degree of excellence which surpassed all others, until the horses of Arabia and the adjacent portions of Asia and Africa became the most celebrated for speed, courage, intelligence, and docility of any of the equine race. Small in size, he has a beautiful, lean, bony head, with a very broad forehead, a tapering muzzle, and large well-opened nostrils; his mane is long, thin, and silky. The Arabian has entered into the early history of the best stock of England and America. Although much of the superiority of these horses is attributable to peculiarly favorable conditions of the country where they originated, yet many of their excellent qualities may be traced to kindness and intelligent training by which those qualities were first developed, and through which they have been transmitted until they have become characteristics of the race.

The Arabian understands the value of his horse, appreciates the nobility of his nature, and treats him accordingly. They kiss and caress him, adorn him with jewels and amulets formed out of sentences of the Koran, as a preventive against evil and accidents. "In short," says a modern author, "they treat them almost like rational beings, which are ready to sacrifice their lives for their master's benefit." In the desert he is the familiar comrade, tentmate and playmate of his master, as docile and intelligent as a dog. The Rev. V. Monroe relates an anecdote of an Arab, "the net value of whose dress and accoutrements might be calculated at something under seventeen pence half-penny," who refused all offers made to purchase a beautiful mare on which he rode, declaring that he loved the animal better than his own life. The French author, Dr. St. Pierre, quotes a remarkable instance of the attachment an Arabian feels for his horse: "The whole stock of a poor Arabian of the Desert consisted of a most beautiful mare. The French Consul at Said offered to purchase her with the intention of sending her to his master, Louis XIV. The

Arab, pressed by want, hesitated for a long time, but at length consented on condition of receiving a very considerable sum, which he named. The Consul, not daring without instructions to give so high a price, wrote to Versailles for permission to close the bargain on the terms stipulated. Louis XIV gave orders to pay the money. The Consul immediately sent notice to the Arab, who soon made his appearance mounted on his magnificent animal, and the gold he had demanded was paid down to him. The Arab, covered with a miserable rag, dismounted and looked at the money, then turning his eyes to the mare he thus accosted her: "To whom am I going to yield thee up—to Europeans, who will tie thee close, who will beat thee, who will render thee miserable. Return with me my beauty, my darling, my jewel, and rejoice the hearts of my children." "As he pronounced these words he sprang upon her back and scampered off toward the desert."

It is not surprising that such a high appreciation of, and fondness for, this noble animal, united to an intelligent training, has resulted in the production of a race of horses unrivalled in excellence. But among Europeans and Americans the treatment of the horse has been usually so harsh, and the mode of training so deficient in intelligence as to greatly lessen his value, even where a brutal ignorance has not brought into activity every vice latent in his nature. Of the numerous faults ascribed to the horse, a very small portion are chargeable to his natural disposition, the remainder being the direct result of vicious training, or rather the absence of training and the substitution of something which, under that name, first produces and then fosters the faults for which the animal is punished; while often the punishment is ineffectual, because the animal has no conception of why it is made to suffer.

THE HORSE

BEST METHODS OF TRAINING

LIKE many an old system that has in the main outlived its usefulness, brute force as applied to horse training is passing out, and in its place the gentler method of teaching the animal, that while the master must be promptly and implicitly obeyed, he is at the same time a truly indulgent master requiring nothing that is not necessary to be done, and, the task being once done, reward in kindness, care, and rest follow. It is not to be understood of course that the whip, and spur, and the "terrible voice" have passed the bounds of the memory of man; for there are still too many men of brutal instincts who are only too willing to exercise them on subject creatures, but their number is decreasing rather than the reverse. Not only this, but a horse trained by the more gradual and gentler methods is always the more safe and reliable animal in every spot and place.

THE FIRST LESSONS.—The first lessons should be given at a very early age. Some who should know say as early as at five days old. The common practice has been to let the colt remain unbroken until a certain age is reached. This is a dangerous method to follow, both for the colt and for the trainer, for the colt is likely by this time to have acquired habits of which it will be hard to break him on account of his great strength. If the little colt is trained at the proper time, and the training patiently carried on until he is a horse, he will scarcely know what "breaking" means. Take the colt in hand at an early age and train him by degrees. The common mistake is trying too teach him too much at a time. Be gentle and kind to him, allowing him to examine you carefully. Whatever he understands to be harmless he does not fear. In moving up to him, should he show fear, be gentle, and move carefully, and he

will soon comprehend that you are harmless, if allowed the privilege of examining and understanding you in his own way—with his nose. Don't use the whip at this early age, for if you strike him he will be afraid; his strength can be easily overcome, and he can be taught his first lessons without the whip. Never let him know what fear is, yet you must control him; there should never be a time when the colt does not recognize the mastery of his keeper and the necessity of obedience. Handle him every day until he is perfectly gentle and knows no fear. It is at this early age that many of the vices are formed, if allowed to go without proper early training. The old adage of "as the twig is bent, so the tree is inclined" is just as applicable to the colt as to the son of his master. Be sure that the colt has learned the first lesson thoroughly before attempting to teach him another.

HALTER BREAKING.—One of the first lessons for the colt is the use of the halter. This should be taught him when he is a suckling. A strong, well-fitting halter should be placed on him, and he should be tied short near to his mother and in such a position that he cannot pull back too far and throw and choke himself. A colt should always be tied strongly so there will be no danger of breaking loose, for if he breaks loose once, he is likely to try to repeat the act. After the colt is well halter-broken, so that he can be tied and led, it is a good plan to let it go with the mother at times when he will not be too much bother, but do not keep him with her all the time; tying his halter to her hame or collar; in this way he gets used to walking and trotting beside another horse.

If the work of halter breaking has been left until weaning time, or when the colt is to be stabled, the lesson will not be so easy. In this case the colt must be first driven into a confined space, where he cannot escape. Take the halter in both hands, and keep holding it to the colt until he will touch it with his nose. Do not hurry. The important thing now is to show the colt that there is nothing dangerous about the halter. When he ceases to be fearful, place the halter on his head quickly and fasten it. If he shows no serious fear tie him up at once. Should

he seem frightened, allow him to wear the halter for a time until accustomed to it. When you tie him, do so securely and see that halter and strap or rope is so strong that there will be no chance of his breaking it, for in all probability he will sooner or later put it to the test. If he cannot break loose, there will be no bad habit to break off at a later time. When he stops pulling he is halter-wise, so far as standing quietly is concerned, and he will cease from pulling on the halter simply to free himself. Stay near him until he gives up, so in case he gets into trouble you may help him out.

LEARNING TO LEAD.—The next lesson for the colt is to learn to be led. Take the colt to some place, where, if it throws itself, it will not get hurt. The best time to learn to lead is within two or three weeks after birth. Have the lead strap 10 to twelve feet long. Let the colt play around in a circle if it chooses for a time. Approach him gently, take the lead strap four or five feet from the halter and stand facing the colt; commence to pull gently, at the same time telling him to come to you; if he starts to rear, ease up a little. After rearing once or twice he will come to you, then pet him; step back and repeat the process; in a short time the lesson is learned and he leads anywhere. The next day he may have partially forgotten, but it soon comes to him again, and in three or four days he leads like an old horse.

TO MAKE A COLT COME TO YOU.—Have a long, flexible whip. Place yourself just so far ahead of the colt that you can easily touch him on the flank, and then bid him "come here," at the same time pulling on the halter. If he does not come, touch him on the flank or on the forelegs lightly, and so continue until he obeys. If he pulls back, check him, and continue touching him until he comes to you. Then pet him, give him a small bit of sugar, a piece of apple, or something that he is fond of. Continue in this way until he comes readily at the word.

HOW TO PROCEED WITH THE BRIDLE.—To accustom the colt to the use of the bit is one of the lessons to be

early learned. A bitting bridle should be put on for an hour or more a day until he is familiar with it. An "open bridle" should always be used at first in order that the colt may see and familiarize himself with all that is going on about him. There should be no lines or reins attached. Later this style of bridle may be changed to one with "blinders," then gradually the use of lines may be taught him.

LESSONS IN SOUND SIGNALS.—Thus far the endeavor has been to accustom the colt to prompt obedience to command expressed by voice and signal. The voice must be the chief reliance. The signal by sound should always precede the signal by signs, or the check by strap or rein, and should always precede the tap of the whip, when the whip is necessary. The same word should be used to induce the performance of a certain act, as: Whoa! back! go on! come here! When this has been done and the colt taught to stand at rest, to lead quietly or to circle about the teacher at the end of the rein, he should next be taught to follow the master about the yard without leading, first with the halter strap in hand, the tutor backing as the colt follows, and afterwards with the strap around the neck of the colt.

The first lesson in backing may be given by taking the colt by the head, standing in front of him and using the word "back," at the same time pushing in the proper direction, and tapping him on the breast if necessary. After a time the colt will back promptly and continuously at the word. This lesson and all others of flexions must be taught with the bridle and bit, since to back easily and properly the head must be raised.

TEACHING THE COLT TO DRIVE BEFORE BEING HARNESSED.—In breaking colts a large, smooth bit is to be preferred. There are on the market some slightly flexible, leather-covered bits that are very good. A straight or a single joint bit is to be preferred. After the colt is thoroughly acquainted with the bitting rig, a saddle, back strap and crupper of a single harness should be carefully put on and be kept on for an hour or two a day, until he is well accustomed to it. When this is done a bridle can be put on, the lines passed through the loops for the shafts, and the colt driven. By passing the lines

through the loops, the colt can be prevented from whirling around and getting tangled up in the lines. It is usually a good plan to have an attendant lead the colt until he understands what is wanted of him. Make haste slowly and remember that while of necessity the instructions herein given must of necessity follow in close order, that the instructions to the colt should be extended gradually over his entire colthood. Teach him to move his body in the direction his head is turned. Drive him to the right in a circle for a time, then to the left until he readily answers the prompting of the reins.

HARNESSING AND DRIVING.—At about two years is the best time to put the colt to light work. He has better teeth than at three years, and has arrived at the period when careful driving will assist to spread and develop the frame. The great danger here is giving too much work, and unless this be guarded against, he best not be trained.

After the colt has been taught to drive single, the breeching and traces should be attached and arranged so there will be no flapping and the colt hitched up with a reliable but quick acting horse. It is a mistake to put a colt with a slow, lazy horse, for his actions only irritate and confuse the colt. After being driven double awhile, hitch the pair to a substantial vehicle. When hitching up a colt for the first time in this way, it is a good plan to put a pair of single lines on the colt's bridle, which may be handled by an assistant. In hitching up double, a good, heavy wagon is preferable, and especially one with a brake. Place the colt on the "off" side, as he is more easily managed there, and can be touched up with the whip better. If the colt rears and plunges, keep the steady horse in motion and talk to the colt. If he shows too much temper, a few good cuts with the whip will bring him to terms, but in punishing strike but once, repeating if necessary. This discipline, administered with care, and driving to make them waywise, is all the difficulty one need ever have with colts.

Some horse trainers prefer breaking a colt in shafts before hitching him up double. A cart for breaking colts single should be substantial, with long, heavy thills, and the seat arranged

behind so the driver can get off and on quickly. The colt should be hitched far enough ahead in the cart so that he cannot kick to do any damage. A strap—commonly called a "kick strap"—attached to each shaft and passed over the colt's croup should always be used until the colt is well accustomed to the thills.

When a colt is first hitched up in a two-wheeled cart, an attendant should hold him until the driver is ready, then he should be allowed to go. As soon as he becomes familiar with the cart, he should be compelled to stand until he is told to start.

Teaching a colt to back is usually best done by placing him in with a horse that will back well, the wagon being placed part way up a slight incline so it will run back easily, and after a time backed on level ground. An assistant takes the lines and tells the colt to back, while the trainer takes hold of the colt's bit on either side and assists in forcing him backward. If he refuses to go, a slight cut across his front legs, or tapping the legs with the toe will cause him to step back. Time and patience are often required to make a colt back well. He must always be compelled to respond to a traction of the bit, even if a cut with the whip be necessary. He should not be allowed to twist head and neck around without moving the body. In teaching him to draw, he should be hitched with another horse of his own temperament and agility. At first, loads must be light, increasing as he becomes accustomed to his work. A young horse not accustomed to pulling should never be hitched to a load if there is any doubt of his ability to move the same readily.

HOW TO SADDLE-BREAK THE COLT.—Prepare the saddle by tying each stirrup strap in a knot to make them short, preventing them from flying about and hitting the colt. Then double up the skirts and take the saddle in your right arm so as not to frighten him with it when you approach. When you get to him, rub him gently a few times with your hand, then raise the saddle very slowly until he can see it and smell and feel it with his nose. Now let the skirts loose and rub them very gently against his neck, the way the hair lies letting him hear the rattle of the skirts and feel them against him, each time a little farther backward, and finally slip it over on his back,

Shake it a little with your hand, and in a little time you can rattle it about over his back as you please, pull it off and throw it on again without his paying much attention to it. As soon as you have accustomed him to the saddle, fasten the girth. Be careful about this. It often frightens a colt to feel the girth tighten around him. Bring it up very gently, and do not draw it too tight at first—only just enough to hold the saddle on. Move him a little and then tighten as you will, and he will not mind it. You should then lead him about the stable a few times; then remove the saddle and replace it. See that there are no loose straps about the saddle to flap about and scare him. After he becomes thoroughly accustomed to the saddle, and is not afraid to see you anywhere about him, and will follow you anywhere you wish to go with the saddle on him, you may, if he is old enough to bear your weight, proceed to mount.

HOW TO MOUNT THE COLT.—You should go all around him, move the saddle skirts and see that they do not frighten him. Place a block by the side of the colt and get on the block. If he seems frightened at your appearing higher than usual, repeat the lesson until the fear is all removed. Go slow. Lean on the saddle, put your foot in the stirrup, and allow him to bear your weight. Allow your knees to rest against him and your toe to touch him under the shoulder. Repeat this several times, or until the animal is accustomed to it. You may now raise your leg over his croup and he will not get frightened. When these precautions are taken, there are few horses so wild that you cannot now mount without making him jump. When mounting, the horse should always stand without being held.

HOW TO RIDE THE COLT.—When you want the colt to start, do not touch him on the side with the heel or strike him with the whip. At once speak to him kindly, and if he does not start, pull him a little to the left until he does so, then let him walk off slowly with the reins loose. Get on and off until he will stand when you get into the saddle. Get on from both sides until he becomes thoroughly familiar with the movements and stands still. After you have trained him in this way for several

hours you can ride him anywhere without having him jump or make an effort to throw you. When you mount a colt, take a little shorter hold on the left rein, so that if anything frightens him you can keep him from jumping by pulling his head around. This operation of pulling a horse's head around to his side will prevent his jumping ahead, rearing up, or running away. If he is stubborn and will not go, you can make him move by pulling his head around to one side, when whipping will have no effect. Turn him around and around until he gets dizzy, then give him his head and a little touch with the whip and he will go along without any trouble. The martingale should never be used when a colt is learning. He should now be perfectly gentle and familiar with the halter, bridle, saddle and the different parts of the harness, and should be accustomed to follow readily when led either by the halter or bridle, and to stand in either the company of other horses or alone.

HOW TO BREAK WILD AND VICIOUS COLTS.— One of the best plans for breaking wild and vicious colts is by what is known as the Rarey method. This consists in conquering the animal by depriving him of the use of his limbs, and making him feel that he is utterly powerless in the hands of the operator, and must submit to whatever is required of him. It is a system that condenses in a short time the work that would ordinarily cover the whole period of colthood up to the time. Mr. Rarey used an ordinary halter to which he attached a straight bar bit 4½ inches long between the rings, with side bars. The attachment is made by means of two small billets and buckles. The first step will be to halter the colt, which may be done by driving him into a close box or stall and haltering him if necessary from the outside. When bridled the next move is to throw him on his side. To throw him, do as directed in OPERATIONS on page 347. When down, rub and caress him, treating him with the utmost gentleness, and every effort should be made to quiet his fears and soothe his exitement. He must be shown that though mastered he is not in any way hurt. Stroke his hair with the hand; pat his body, neck, and head; handle his feet, legs, and ears; in this way manipulating every part of the body. The operator may

now sit down upon him and get all over him; for the more motions and changes that can be gone through with, the better. The harness should be rubbed over him; the saddle laid on him; and the chains rattled over him if such are used. Continue this until all symptoms of fear have disappeared, and then allow him to get up. When on his feet, place the saddle on his back and each piece of harness. If he scares and jumps and acts ugly, take them off and throw him as at first. Bring the buggy and allow the wheels to pass around where he can see them, and lay the shafts on him. Continue doing this until he is familiar with every part of harness, saddle and carriage. Whatever is undertaken must be perseveringly taught until understood, for if the horse is not thoroughly conquered at the outset, a long course of training will be needed to bring him to proper subjection. Do not use harsh words or means. In handling the colt be gentle and soothing, bearing in mind that the law of kindness is more potent than that of force. All directions given for training colts apply here.

Another method that is very effectual in taming wild and ugly colts is by the use of the knee strap. It is especially good for a "kicker." Take up one forefoot and bend the knee until the hoof is bottom upward; and then slip a loop over his knee and shove it up until it comes above the pastern joint, being careful to draw the loop together between the hoof and pastern joint with a second strap, to keep the loop from slipping down and off. This will leave the horse standing on three legs; he can be handled with ease in this position, for he cannot do much hampered in this manner. When the horse's foot is first fastened up, he will sometimes get in a rage, striking with his knee and trying in every way to get the foot to the ground; but he will soon give this up and with it abandon all ugly actions, be willing to obey, and generally be docile. Repeat this as often as required. This method is attended with less trouble and danger than any other method, since after tying up the foot you can sit down and let him fight it out. When he gives up, go to him, let down the foot, rub his leg with your hand, caress him and let him rest a few minutes, then put it up again. Repeat this a few times, always putting up the same foot, and he will learn to travel some

distance on three legs. When a little used to this way of going, put on the harness and hitch up to the cart or sulky. Even if a kicker, no fears need be harbored that he will do damage with one foot up, nor run very fast; if he wants to run and is given every privilege, and even urged, he will go but slowly on three legs, and will soon tire and be ready to stop. If when discontinuing the strapping up process there is fear that the horse may run or act viciously, straps with rings may be buckled below the fetlock on each foreleg, a small rope tied securely in the ring of the strap on the right leg, passed over the belly-band and down through the ring on the left foreleg, then passed up over the belly-band again and held by an assistant who walks or rides with the trainer. In case of trouble, the assistant by pulling on the rope can hold up one or both feet. If a horse shows a tendency to kick, a twitch on the lines will often distract his attention and prevent kicking. In the case of a nervous and irritated horse, placing a blindfold over the eyes will frequently direct his attention in another direction.

Horses have also been successfully tamed after being haltered by attaching to the halter, by a strong snap, a long rope (25 or 30 feet) at its middle, and having the ends held by two attendants, whose only duty is to keep the rope spread, and to accommodate themselves to the movements of the colt, so as to keep it as nearly within bounds as possible, the trainer's part being to direct the work and to talk to the colt. After rearing and plunging until completely exhausted, the colt will be in condition for the master to begin the lessons in training.

HOW TO USE A STUBBORN HORSE IN BREAKING.—If the animal you are training has a stubborn or mulish disposition, rather than being wild; if he lays back his ears as you approach him, or turns to kick you, he has not proper regard or fear of man, and it might be well to give him a few sharp cuts with the whip about the legs, pretty close to the body. It will crack sharply as it plies about the legs, and the crack of the whip will affect him as much as the stroke. Do not whip much; only just enough to frighten him. But whatever you do, do it with a good deal of fire, though without anger. If you cannot control

yourself you are not fit to handle horses. When he does right, pat and caress him, giving him a piece of apple or something he is fond of. If he does wrong, give him the whip. As soon as he is frightened enough to stand up and pay some attention, go up to him and pet him a great deal more than you whipped him; by so doing you will excite the two controlling passions, love and fear, and he will love and fear you. Then as soon as he understands what you want, he will obey quickly.

If the animal is too mulish to yield to careful and gentle treatment as is here given, then resort to the treatment as in the case of taming wild and vicious colts on page 21.

HOW TO MAKE A HORSE COME AT COMMAND.

Take a small-sized rope about 15 feet long and tie it around the horse's neck the same as though you were tying him to a post; then draw the rope back between the horse's neck and the rope, and you will form a loop; by putting this over the lower jaw you will have a bridle that will be a power in your hands. Having put on the bridle take hold of the rope about 5 feet from the end, and give him a few side pulls, saying at the same time, "Come here, sir!" Then, quickly taking hold of the end of the rope, say, distinctly, "Come here, sir!" and if he comes, caress him; if he does not come, give him a pull sidewise, and repeat the command until he obeys. Now start off with the rope, either to the right or to the left, and if he does not follow you, give him another twitch, and he will soon learn to follow you. Ordinarily it can be taught in ten minutes. Use the same means when turning horse out to pasture, only let the rope go and trail along the ground, and when he gets a few yards away, repeat the command, and if he comes, pat him; if he does not, give him a lively jerk, and he will soon obey without the use of the rope. No matter how far away, if in the field, all that is necessary is to repeat the command and he will come. It is quite necessary to teach a horse this form of obedience, as it is the foundation of others, and is one of the most valuable that a horse can possess.

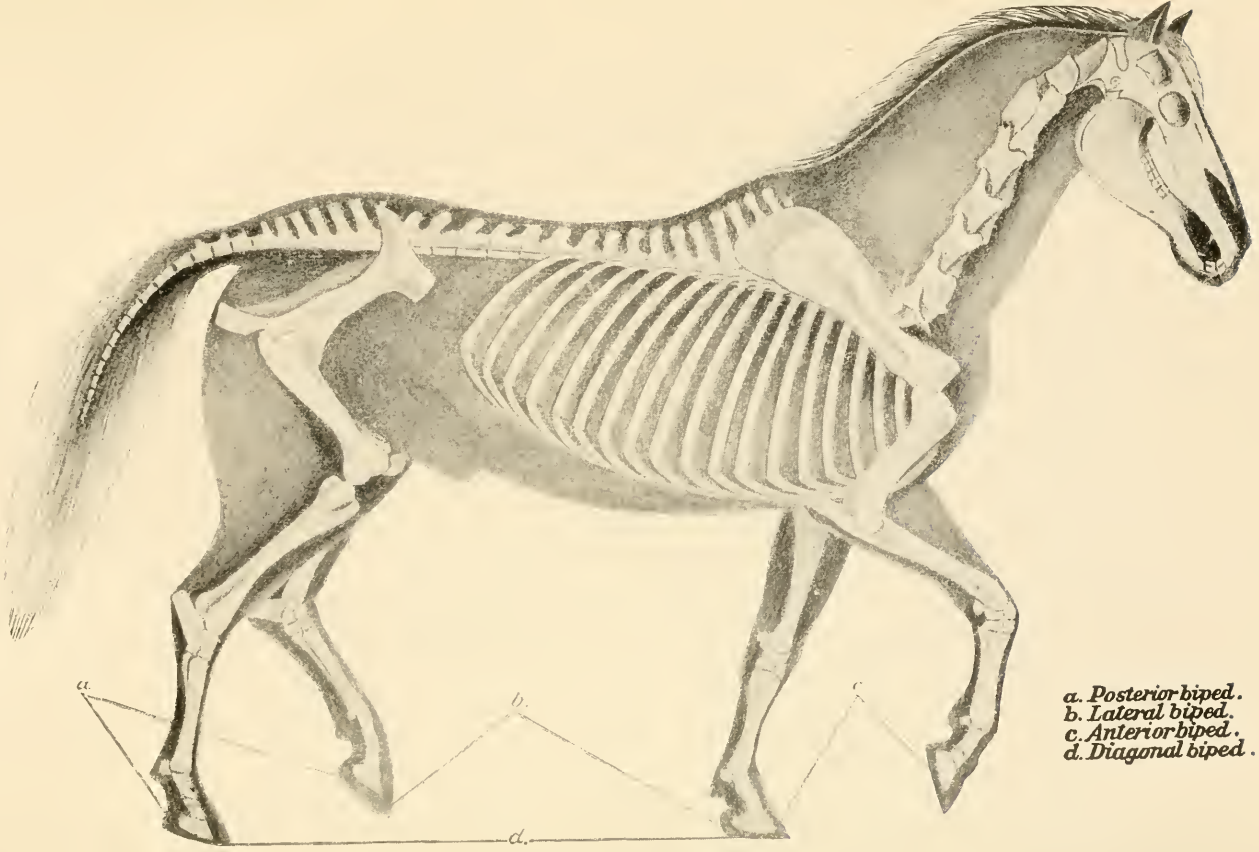
TO BREAK A HORSE OF REARING UNDER THE SADDLE OR BEFORE A CARRIAGE.—Attach a small cord tightly around the swell of the body, tie with a loop knot, one that will not slip, and carry it back to the carriage. By reason of not being able to expand his body, the horse will not rear, since he cannot do so without body expansion. The method is so simple that one would say that there is nothing to it, but if put to the test it will be found of great value in removing a most unpleasant if not a dangerous habit.

TO MAKE A HORSE STAND STILL WITHOUT HITCHING.—First teach the horse to follow you. When he will do this, stand him in the center of the stable. Begin caressing him at the head and gradually work backward. If he moves, give him a cut with the whip and put him back in the same place as at first. If he stands, pet him. Continue this until you can walk about him without making him move. Keep walking about him, increasing the distance gradually, but occasionally touch and caress him. After getting some distance from him, if he should move, give him another cut with the whip and put him back in his place. If he stands, go to him frequently and pet him. Go round him as before; then stand him in another spot and proceed as at first.

TO TRAIN A HORSE TO STAND STILL WHILE GETTING INTO A CARRIAGE.—If the horse rears up and starts suddenly, or will not stand long enough to get in, do not whip him for it, as that only adds to the trouble and may make him stubborn so that he will refuse to go when called upon. Instead, when he is hitched, pet him about the head, then take hold of the lines and put your foot on the step and shake the carriage; if he starts, pull gradually on the reins, and at the same time say "Whoa, my boy," or something like it. Then approach his head and give him something he likes, as a piece of apple, caress him on the head between the eyes and on the nose and neck. Continue this for some minutes. When mounted, do not allow him to start off in a hurry; let him start off slowly. Persevere in the treatment and the horse will become kind about starting off.

HOW TO MAKE AN ANIMAL GET UP THAT THROWS HIMSELF.—Animals often get sulky and acquire the habit of lying down. Horses that are balky when urged to go will often lie down and refuse to get up. Oxen will sometimes lie down in the furrow before the plow. When the habit is thoroughly settled, it becomes very annoying to the owner or driver, and severe means are often resorted to without avail. The following will be found effective:

When animal has thrown himself and refuses to get up, raise the head and pour into his nostril a small quantity of water—not over a pint—and the result will be both effective and amusing. He will get up with an alacrity that will make amends for his sulkiness, for the sensation will be that of drowning and there will be no tarrying on the beast's part to relieve himself. Simple though this may seem, bear it in mind, and the first time you have an opportunity to try its power, prove it to your satisfaction.



a. Posterior biped.
b. Lateral biped.
c. Anterior biped.
d. Diagonal biped.

SKELETON OF HORSE.

ANATOMY OF THE HORSE

TO know something of the structure of the horse is of utmost importance to every one who breeds, rears, or buys them, since in the perfection of the parts that go to make up the complete animal—fineness and solidity of bone, firmness and sufficiency of muscles, healthy organs of respirations, and a high normal condition of activity in the digestive tract—lies the real value of this most valuable servant of man. Not only this, but having some knowledge of the body and its structure, the organs and their functions, one is much better fitted to care for, to treat in case of disease and in every way advance the condition of animals under his care.

THE SKELETON OF THE HORSE.—To make the bony structure plain to the reader, which will first be considered, it is shown by diagram, since it is not only the most easily understood, but is the most accurate method of presenting information of this character. To make the object lesson still more easy, there is given in the illustration, not only the skeleton, but also a background of the outer form and outline of the horse.

The Head.—If a cross or longitudinal cut were made of the head, it would be seen to be full of cavities or sinuses, the uses of which are to lighten the head and to warm the air as it passes into the pharynx on its way to the lungs. It is also full of foramina or small holes for the nerves from the brain, and blood vessels to pass through to the organs situated in the head, as the tongue, lips and the glands in and around the head. There are also the cavities in which the eyes are situated, one on each side of the head. In examining the cavity, one will find a small opening through which the optic nerve passes in coming from the brain to the eye. This is the nerve of sight. But most important of all is the brain cavity, which contains that organ, through which the various movements and functions of the body are controlled.

Cervical, or Neck Bones.—Of these there are seven in number. The first bone is called "atlas;" it is ringshaped with lateral projections like the outspread wings of a bird. It articulates with the skull and has great freedom of motion on the next bone, which is called the axis or "dentata," and which allows the head to turn in any direction, as on a pivot. Between these two bones on the upper side is the only place where the spinal cord is not covered with bone—a spot not larger than a twenty-five cent piece. Here is where the operation of "pithing" is performed in killing a horse. The rest of bones are not named, but simply numbered from before back.

Dorsal, or Back Bones.—These are next in order after the neck bones, and there are eighteen of them. The height of the spines on the upper part of the bones is a point of interest, as they form the withers of the horse, as may be noticed in the cut. On either side these bones we find the ribs attached, eighteen pairs, corresponding to the number of bones in the back.

Lumbar, or Small-of-the-Back Bones.—These are six in number and next in position to the bones noted. They are situated immediately over the kidneys. Are also called "bones of the loin." Their long side processes give the width to the loins and furnish attachment for the large muscles of the region.

Sacral, or Croup Bones.—Before birth these are five in number, but they become united and form one bone. These are situated between the upper hip bones and help to form the croup of the horse.

Coccygeal, or Tail Bones.—These are eighteen in number, and the point of interest is the fact of growing smaller as the end of the tail is approached.

Hip, or Pelvic Bones.—The pelvis is made up of six bones, three on each side, all firmly united in one. The ilium is strongly attached to the bones of the croup, and may be called "the keystone of the arch," the outer part of it forming the pin of the hip or outer angle. The ischium or hip bone is a backward continuation of the ilium, and bears an enlargement which projects

on each side a little below the tail. The pubis is a single bone and is connected with the others, forming an inverted arch with them, and forms the front part of the lower surface of the pelvis. The bladder lies upon this bone.

Sternum, or Breast Bone.—The breast bone in the young horse is composed of six bones, but in the full grown horse it becomes united into one solid piece. The front of the bone is convex and sharply keeled, and its upper part projects so as to be plainly outlined in what is called the "point of the breast," that part just below the lower portion of the collar. This bone is one of the softest of the body, and the first eight pairs of ribs are attached to it on either side.

Ribs.—There are eighteen pairs of ribs. They form the lateral walls of the thorax or chest cavity, and afford protection to the heart and lungs. They are attached above to the dorsal region of the back bone. Below, the first eight pairs are attached directly to the sternum or breast bone, and these are called the true ribs; the remaining ten pairs are attached indirectly to the breast bone by cartilages, and are called "false ribs." Beginning with the first rib they increase in length to the ninth, then grow shorter until the last is reached which is only a few inches in length.

Bones of the Shoulder.—These are two in number; the shoulder-blade or scapula, and the shoulder bone or humerus. They form the shoulder joint, which is a ball and socket joint, and has a strong capsular ligament, and is held down to its place also by several strong muscles. This is the seat of what is called "shoulder joint lameness." The elbow joint is formed by the lower end of the humerus or shoulder bone, and the upper ends of the radius and ulna, the bones of the forearm.

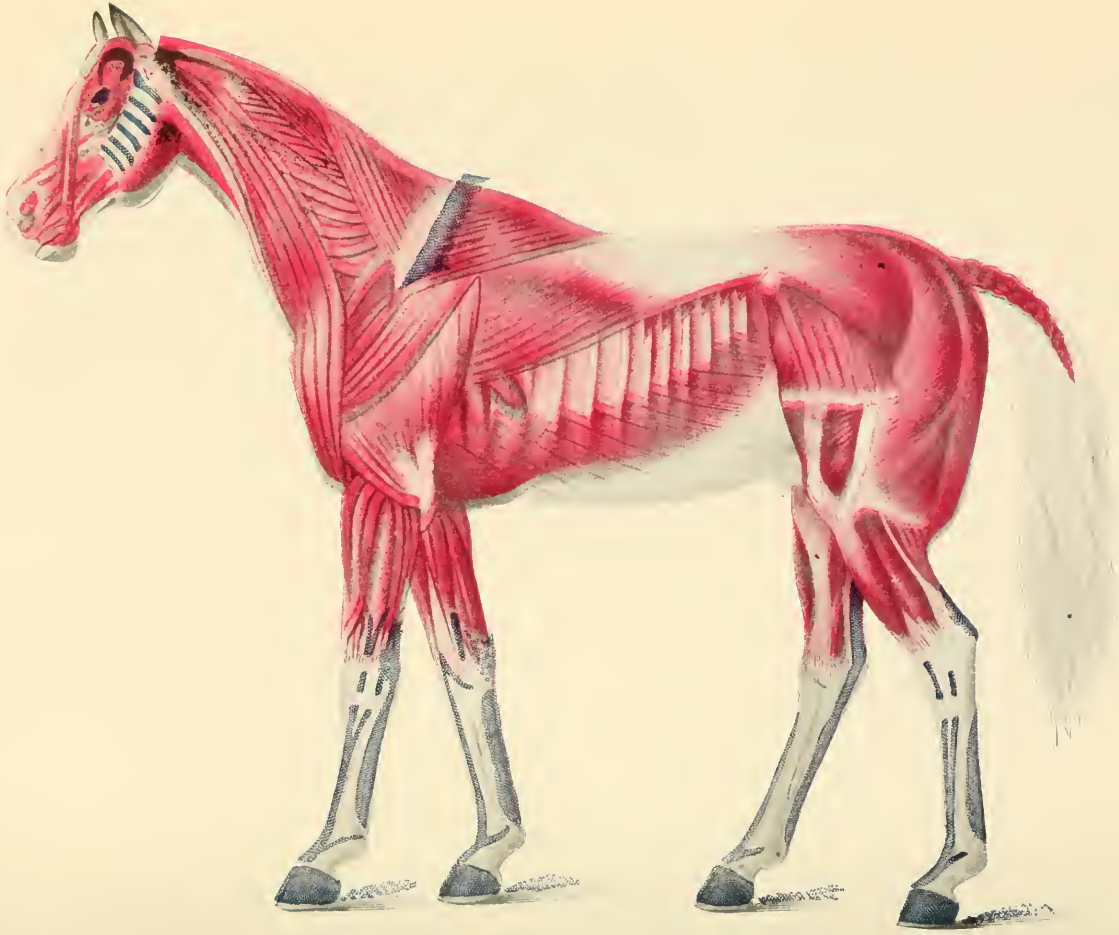
Bones of the Forearm.—The upper part of the foreleg of the horse is called the forearm, and is composed of two bones, extending from the elbow to the knee. One is behind and to some extent above the other; there being a considerable projection received between the heads of the lower bone of the shoulder

(humerus), forming a powerful lever, into which are inserted the muscles for extending the arm. The upper bone ends in a point behind the middle of the other one.

Bones of the Knee.—These bones are eight in number, arranged in two rows, three in each row and one back of each row. The one back of the upper row gives prominence to the back of the knee, acting as a lever and should be large. There are three transverse joints in the knee, one between the upper row and the radius above, one between the two rows, and one between the lower row and the bones below. The greatest amount of movement takes place between the upper row and the radius, a small amount between the two rows, and practically none between the lower row and the bones below; this accounts for the fact that a bony growth on the lower part of the knee may not stiffen the joint to a noticeable extent. The bones are all held together by a large number of ligaments, making the structure very strong.

Bones of the Cannon.—Between the knee and the fetlock are three bones—one large bone and the two small or splint bones. These form what is called the Cannon. The upper end of the large bone articulates with the lower row of bones in the knee, and below with the upper pastern at the fetlock joint. The large bone is nearly straight, rounded in front and flattened or slightly concave behind. The splint bones, which are to strengthen the cannon bone, diminish to a point before reaching the fetlock joint; they are attached one to either back border of the large bone, their upper ends helping to support the lower row of bones of the knee.

Bones of the Pastern and the Foot.—By reference to cut, "Anatomy of Foot," showing the bones of the lower part of the front leg, all the bones and joints may be seen. The part of the leg between the fetlock and the foot is called the "pastern." The upper pastern bone moves freely upon the cannon bone, and at the back of this articulation are two small bones called "sessamoids." The movement between the upper and lower pastern bones is not very great; about one-half the lower bone is within the hoof.



SUPERFICIAL LAYER OF MUSCLES.

The toe is formed by the coffin bone which is surrounded and enveloped in the hoof. The navicular or shuttle bone lies beneath and partly within the junction of the coffin and lower pastern. It is also enclosed in the hoof.

Bones of the Hind Leg.—The femur or upper thigh bone articulates at the upper end with the ilium, which is in turn joined to the back bone. The femur is very large and strong, and has upon it large projections for the attachment of important muscles. The upper end of the femur has a rounded head on the inner side, fitting into and articulating with a cup-like cavity formed at the junction of the three pelvic bones. At the end below are the two prominences fitting into the depressions in the tibia or lower thigh bone, and in front of which is a groove for the patella or knee-cap to work in, the whole making what is called "the stifle joint." The lower thigh is made up of two bones, the tibia or main bone, and the fibula or small bone at the outer, upper part, which reaches down the tibia about one-third its length, and is attached to it.

Bones of the Hock, or Tarsus Joint.—This joint contains six and sometimes seven bones. They are interposed between the tibia above and the cannon bones below. Most of the movement of the joint takes place between the tibia and the upper front bone of the hock; these articulate in such a way as to give a large amount of motion; but slight motion takes place between the other bones. The projecting bone at the back, which forms the point of the hock, acts as a lever for the attachment of a large tendon.

The bones below the hock in the hind legs are the same as those below the knee in front.

THE MUSCLES OF THE HORSE.—In the previous articles the skeleton of the horse was set forth. In this article we will as clearly as possible say something of the muscular system. For purposes of accuracy the scientific world has adopted the Greek and Latin languages as the source of names, since they are generally understood by scholars; for this reason it is difficult to go into the detail of names in a popular work such

as this without cumbering it with a great mass of useless matter, but we will try and give a goodly amount of instruction and put it into language easy of comprehension.

Muscles are the active organs of motion, each being separated from the other by a thin, delicate membrane of connective tissue, which forms a sheath for the muscle. They are divided into two parts—fleshy and tendinous. The first is larger than the second and is sometimes called the "belly of the muscle." It is the "lean meat," to use a popular term. At both ends of the muscle is the tendinous part, which is hard and white and forms the attachment to the bone. Every muscle is attached to two or more places on different bones, and by their contraction move the joints of the body. They are supplied with nerves, which give energy and feeling, and also well supplied with small blood vessels, from which the muscle is fed. There are two kinds of muscles —voluntary and involuntary. The voluntary are under the control of the will of the animal, as the muscles which move the leg or head. The involuntary are those that work without conscious action of the will, such as those of the heart, or of the breathing organs.

Muscles of the Head and Neck.—The masseter muscle forms the cheek of the horse, and its function is to close the jaw; the temporal muscle also assists in the action of chewing, and the dimpling seen above the eye in doing so is from the action of this muscle. The eye has two muscles—one to close the eye and one to raise the eyelid. The ear muscles are not conspicuous; one turns the ear forward, a second turns it inward and backward, while a third descends at the back of the cheek and turns the ear outward. The nose and lip muscles are important, since they aid in gathering food, and in expanding and contracting the nostrils in breathing. They also, in connection with those of the ears, aid one in judging much as to the temper of the horse. One muscle entirely surrounds the mouth, and it opens and closes the lips; another, a pyramid-shaped muscle, covers the nostril, and also raises the upper lip. The under lip is drawn back by a narrow muscle, which is inserted into the lip below the angle of the mouth; it passes along the side of the jaw, disappearing under the cheek muscle—the masseter.

One of the principal muscles of the neck originates in the four or five first dorsal bones and in the lower five bones of the neck; from these points uniting into one muscle, which makes up the principal lower part of the neck, and which, diminishing in size as it passes toward the head, terminates in a tendon inserted in the bone covering the top of the head. Above this is another muscle called the splenius, which is inserted into all the bones of the neck except the first, but having with this and the top of the head a separate connection. To the form and development of these muscles the muscularity and beauty of the neck is due. The thick crest and massive neck of the stallion are largely due to the development of these muscles.

On the front of the neck are three muscles that may be mentioned, the first of which is the hyoid muscle; this is attached to the hyoid bone of the tongue; descends along the front of the neck close to the trachea, or windpipe, to the point of the breast, but is for most of its length covered by other muscles. The principal depressor muscle of the neck partly covers the hyoid muscle; it rises from the upper part of the point of the breast, covers the lower front of the neck, proceeds upward just underneath the skin, and is inserted by a flat tendon into the rear angle of the lower jaw. It forms the lower border of the groove on the side of the neck, called the "jugular furrow." Extending from the back of the head and upper part of neck, along the side of the neck forming the upper border of the jugular furrow is an important muscle which spreads out over the point of the shoulder. It has a double function; with the head fixed by its own muscles, it becomes the point from which this muscle raises the shoulder—but the action can be reversed. With the shoulder as the fixed point, the head can be depressed by means of a small slip of muscle being carried forward to the point of the breast bone to bear the head in that direction. The muscles are all arranged in pairs, sometimes, but rarely in contact; so that in speaking of them in the singular, their function and position is to be understood as applying to each side of the animal.

Muscles of the Shoulders and Back.—An important muscle is one called the trapezius muscle. It rises from the

ligament of the neck and the principal bones of the withers, and terminates in a pointed shape on the prominent part of the shoulder-blade. Its office, assisted by another muscle, is to raise and support the shoulders. Occupying the outer surface of the shoulder-blade, on the front side of the spine or ridge of that bone, is another important muscle, the anterior spinatus. It proceeds to the lower bone of the shoulder (the humerus), and dividing into two parts is inserted into the two prominences on the front of it. Its office is to carry the bone forward. Covering the shoulder-blade, back of the bony ridge, is another muscle called the posterior spinatus. It is these two muscles which waste away in Sweeny. Inside the arm at the junction with the body is the large pectoral group of four muscles, whose work is to pull the whole foreleg inward, keeping it in line with the body, inducing an even and regular action of that member, and forming the breast. On the outside of the shoulder, and easily seen when the horse is in motion, is a triangular group of large muscles, whose office is to straighten and extend the forearm, bringing it down perpendicularly and in line with the lower bone of the shoulder (the humerus). Arising from the back border of the shoulder-blade and the lower bone of the shoulder, they are inserted into the point of the elbow. The muscles which bend the forearm upwards are not visible in the living horse, being nearly covered by those of the shoulder.

The principal muscle of the back extends from the shoulder to the haunch; it is strongly attached to the processes of the back bones and to the ribs, and is employed in raising the fore and hind parts and in rearing and kicking. The portion nearest the surface is that covered by the saddle, but no part is distinctly apparent without dissection.

Muscles of the Fore Legs.—These may be divided into two classes—extending or straightening, and flexing or bending. The first named are the ones that straighten the leg. Above, these muscles are attached to the bones around the elbow joint and pass down on the front of the forearm; about three inches above the knee they change into tendon and become what are called the "cords of the leg." Some are attached just below the knee joint

to the cannon bone, and others pass down in front of the cannon and attach to the foot bone.

The flexing or bending muscles are situated at the back part of the leg; are attached above to the back part of elbow joint and pass downward on the back part of the forearm. Above the knee they also become tendinous, a part of them attaching to the little bone at the back of the upper row of knee bones, and in acting bend this joint, while two continue down the back of the cannon, forming what are called the back tendons, and are attached to the bottom of the foot bone.

Muscles of the Hind Quarters.—Among the prominent muscles of the hip are what are called the gluteal muscles; they are large and make up a large part of the flesh around the hip bone. Their function is to carry the the hind leg back, and so when the foot is fixed to the ground, push the body forward. They have been termed the "kicking muscles." The principal one arises in the bones of the loin, and in the side bone of the pelvis, and terminates in a projection on the upper bone of the thigh, (the femur).

Another important muscle is the "three headed muscle" of the thigh. Really it is three in one, having a common origin and united together. Originating from the sacral bones, and from various parts of the pelvic bones, it curves downward and forward, dividing into three heads, which are inserted into the upper part of the lower bone of the thigh behind the stifle joint. It assists the preceding muscle in carrying the leg backward, and hence throws the body forward when the foot is fixed. Parallel with and behind this is the "double-headed muscle" that descends from the croup and first bones of the tail, to the inner side of the lower bone of the thigh. It forms the rear border of haunch and assists the two preceding, the three being very important muscles and should be large in draft horses. The rectus muscle forms the front of the thigh and extends from the side bone of the pelvis, in front of hip joint, to the patella or knee-cap. It, with two assistants, carries the leg forward.

There are a number of muscles on the inside of the thigh which keep the leg from swinging away from the body. Of the

muscles of the tail there are four—one on the upper side, its office being to raise the tail; two are on either side, to draw the tail in either direction sidewise, and one on the under side to draw and hold the tail down.

Muscles of the Lower Thigh, or Gaskin.—Like the fore-leg these may be divided into the flexing and extending muscles. The first named are attached above around the stifle joint and descending down the front of the thigh bone, one becomes attached to the front of the cannon just below the hock and flexes this joint, while the others pass through sheaths or loops at the hock to hold the muscles firm while leg is in action; thence continuing down in front of the cannon bone to the fetlock, we find them passing through loops or sheaths, then on down in front of the pastern bones, and widely expanding are inserted into the upper part of the coffin bone; these straighten the fetlock joint. The back muscles are attached above, around the stifle joint at its back; they become tendinous before reaching the hock. Two of the principal ones pass down to the back part of the hock joint, known as the "point of the hock," to which one is attached; they form what is called the "ham-string." The other passes down the back of the cannon to the fetlock joint through a sheath, along the back part of the pastern bones, and is attached to the lower one. This tendon, from the hock down, forms one of the back tendons of the hind legs. Another important muscle passes down underneath the one already mentioned, through a sheath at the back part of the hock where it is supplied with a synovial sack, and then passes down the back of the shank or cannon bone beneath the other tendon, through the sheath at the fetlock to the back part of the bone of the foot where it is attached. The one which attaches to the point of the hock straightens that joint and is important in propelling the animal; those going to the foot bend that member backward.

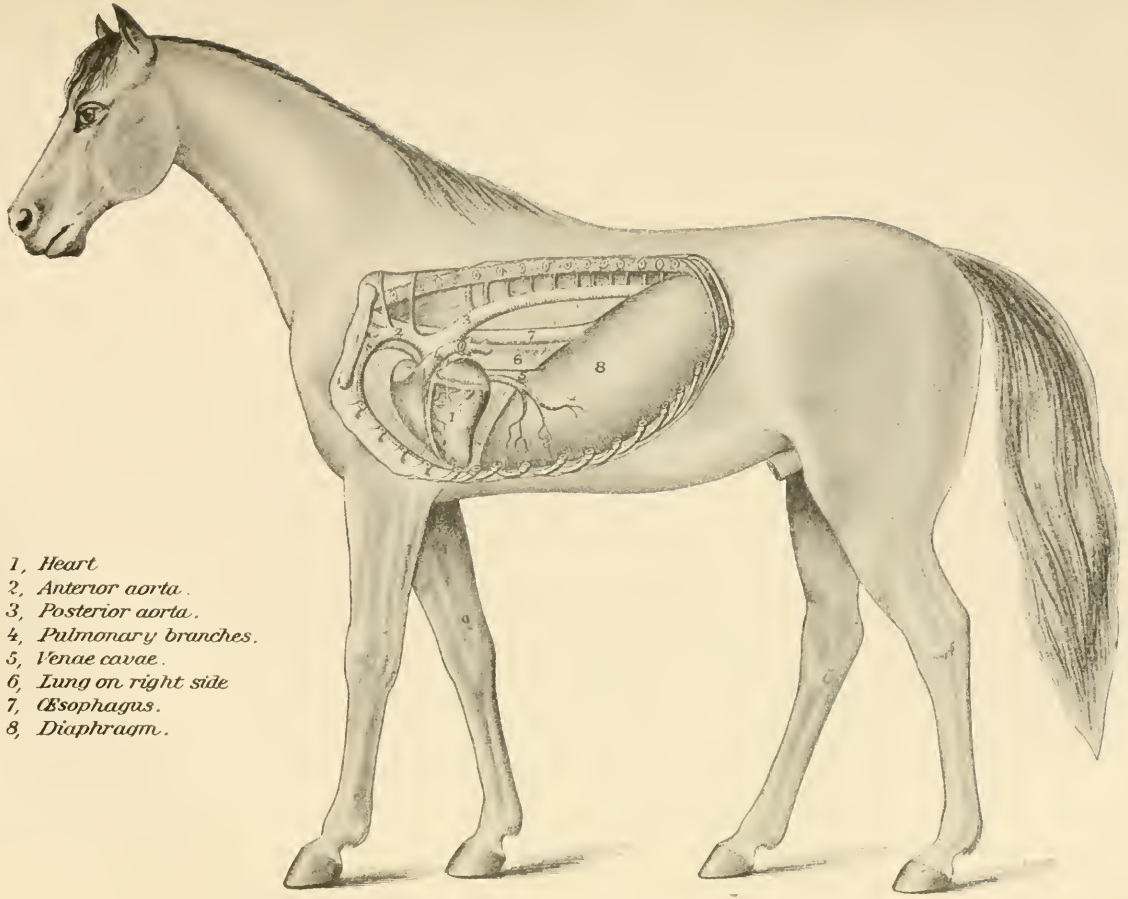
Involuntary Muscles.—Are those that control to some extent the expansion and contraction of the lungs in breathing; the action of the heart in beating, and they also help form the walls of all the hollow organs, as the digestive tract, the bladder and the womb.

The Diaphragm is a large muscular curtain which separates the chest from the abdomen; it has an important action in breathing.

THE NERVOUS SYSTEM.—The nervous system is a very important set of the organs which give energy and feeling to the body, and interpret impressions received through the medium of the senses, such as seeing, smelling, hearing, etc. The brain is the center of the nervous system, and is situated in the cranial cavity. It is surrounded by three delicate membranes, called the "meninges," the outer one being attached to the inner wall of the cranial cavity. From the brain the nerves which supply the various organs in the head are passed down through the foramina or openings to their respective points, as the optic nerve to the eye, the auditory nerve to the ear, the olfactory nerves that supply the sense of smell to the nose, and the nerve of taste to the tongue. Other nerves pass to other parts of the head to give feeling and motion, and still others to the pharynx to give the power of swallowing. In passing from the brain along the spinal cord, which is situated in the canal of the bones of the back, there are numerous small nerves, given off to supply the muscles of the neck, giving both feeling and motion. About opposite the shoulder-blade the spinal cord gives off a large bunch of nerves, part of which gives nerve power to the heart and lungs. An important point to remember is: that if the spinal cord is injured in front of these nerves, death is the result. The other part of the nerves supply the shoulders, chest and muscles of the front legs. Farther back are given off the nerves that supply the organs of the abdominal cavity. In the region of the hips are another lot of nerves given off, some going to the rectum, the womb and the bladder, assisting in the functional work of those organs; others supply the muscles of the hips, hind legs and the tail. Nerves have the appearance of white threads held together by a common tissue sheath. The brain of the horse weighs on the average 23 ounces; that of man 50 ounces.

THE CIRCULATION.—The system of circulation is carried on by means of the heart, arteries, capillaries and veins, and the very important fluid, the blood.

The Heart.—The heart is the principal organ of circulation; it weighs in the average horse about six to six and one-half pounds. It is a hollow, involuntary, muscular organ, and acts as a force pump in maintaining the circulation of the blood, and is situated between the lungs. The bottom end or apex is downward and rests just above the breast bone, the base or upper part being directed upward and to the left side, the left lung having a hollow on its side for the heart to work in. There is a sac around the heart which helps to protect and support it, being attached to the back bone above, and to the breast bone below. The sac is composed of a whitish fibrous tissue, smooth inside, with many small glands that secrete a watery substance that lubricates the outer heart wall and the inner sac wall, so that in action the walls are not irritated. The heart cavity is in two parts, the right and left sides, each one of these are again divided into an upper cavity called the auricle, and the lower called the ventricle, so we have right and left auricle and right and left ventricle. The right auricle communicates with the right ventricle through an opening in the septum or partition on the right side of the heart, but a return is prevented by a valve. The left auricle opens into the left ventricle in the same way. The right side is sometimes called the venous side and the left side the arterial side. Two large veins empty the impure blood of the body into the right auricle. The right auricle contracting forces the blood through the opening in the partition into the right ventricle; the valve preventing return. The right ventricle contracts and forces the blood into the pulmonary artery, which branches a few inches above the heart, connecting with the right and left lungs. These are again divided into other small arteries which flow into what is called the capillary net-work, which is situated around the air-cells of the lungs, where the blood gives up its carbonic acid gas, and takes in oxygen from the air, which changes the color from a dark purplish red to a bright red. Here is emphasized the necessity of well ventilated quarters, in order that the carbonic acid gas may be carried off and the oxygen supplied. The pulmonary veins now return the blood to the left auricle, and the contraction of the auricle sends the blood through the opening into the left ventricle, which



INTERIOR OF CHEST, SHOWING POSITION OF HEART AND DIAPHRAGM.

opening is guarded to prevent a return, while the left ventricle contracts and forces the blood into the aorta or large artery of the body, which passes above the heart two or three inches, where the artery branching, sends one forward to supply the parts of the body in front of the heart, and another backward along the spinal bones, to supply the body behind the organ.

The branch that goes forward soon divides, sending off branches to supply the shoulders and forelegs, while two other branches, called the carotid arteries, pass along each side of the neck under the jugular veins, giving off branches to supply the muscles and parts of the neck. Just below the butt of the ears these divide again each into three large branches, which supply the brain and other parts of the head. The branch of the aorta that turns backward from the heart is a very long and large one, passing below the spine and between the kidneys, branching again a few inches beyond into four large arteries, two to the left and two to the right side, supplying the pelvic cavity and the hind legs. Before the division into four branches, other small branches were given off, supplying the liver, the spleen, the stomach, the large and small bowels. and one to each kidney. As the blood nears the extremities the arteries grow smaller, until at last the blood reaches the capillaries—small vessels connecting the arteries and veins—where the blood unloads its nutritive matter and takes on the waste material, conveying it back to the heart through the veins.

Arteries are the vessels that convey the blood away from the heart to the different parts of the body, which being purified in the lungs by air contact is pure and of a bright red color.

Veins carry the blood back to the heart loaded with the impurities that are taken up in the capillaries, and it is then a dark, purplish color.

The Capillary Vessels are small vessels about 1-3000 of an inch in diameter that are arranged in varied form in net-work between the termination of the arteries and the beginning of the veins. It is here that the nutritive elements are given up to the tissues and the waste matter is taken up.

The Lymphatic, also known as the absorbent system, is connected with the blood vessels, and is made up of very minute tubes and glands, which convey from the tissues of the body a clear fluid known as lymph, and pour it into the blood of the veins as it is on its way back to the heart. These glands are found all through the body—in every tissue of the body supplied by blood. It is from an inflammation of these glands that are found inside of the thigh and shoulder, that we have the disease known as "lymphangitis" or "water farcy."

THE DIGESTIVE ORGANS.—The digestive organs comprise the alimentary canal and accessories from the mouth to the anus. The chief parts are the mouth, pharynx, esophagus, or the tube leading from the pharynx to stomach and the bowels, or intestines. The mouth is the cavity at the beginning of the digestive canal; in front are the lips; at the sides, the cheeks, which are lined by what is termed mucous membrane, that has several openings in it from the glands, which supply the saliva. On the upper surface of the mouth the mucous membrane is thrown into folds or bars, from eighteen to twenty in number, which assist the tongue in the manipulation of food. The tongue is an important member in articulation, in mastication and in taste.

The Teeth.—The teeth perform a most important office in masticating food, thus helping to prepare it for digestion. The horse has two sets, the milk teeth of which there are twenty-four; and the permanent teeth of which there are forty. In the mare the tusks are rudimentary or wanting, hence there are usually thirty-six. The incisors, or front teeth, are twelve in number, six in each jaw, the upper being longest; the two middle ones are called nippers, or central incisors, the two adjoining teeth lateral incisors, and the outer ones corner incisors. The tusks or canine teeth are four in number, a pair above and below; as has been stated these are generally wanting in the mare. The molars or grinders are twelve in the milk teeth, and twenty-four in the permanent set—six on each side above and below. Like the incisors, those of the upper jaw are the largest. In addition the horse may have supplementary molars called wolf

teeth, small round pointed teeth that come in the upper jaw, also sometimes in the lower jaw, in front of the molars, one on each side.

The Salivary Glands.—These are the glands that secrete the saliva that is poured into the mouth while the animal is eating. There are three pairs of importance, one large pair on each side of the throat below the ears, filling the space between the jawbone and neck; this pair has ducts passing around and under the lower jaw and up into the cheek muscles, entering the mouth opposite the third molar. The next pair are below the first mentioned and open into the bottom part of the mouth. The third pair are situated under the tongue, one on each side; by many small ducts they empty saliva into the mouth. The use of saliva is to liquify starchy food, and to convert it into dextrin and maltose; it also aids mastication and assists the sense of taste by dissolving the food.

The Pharynx.—A cavity just back of the mouth common to both digestive and respiratory tracts. It is separated from the mouth by a curtain called the soft palate; this is very large in the horse, preventing food from returning into the mouth after having entered the pharynx.

The Esophagus or Gullet.—Is a tube, lined with mucous membrane about the same as the mouth, that extends from the pharynx to the stomach. Its office is the conveying of food from the pharynx to the stomach by means of successive contractions of its muscular coat.

The Stomach.—The stomach of the horse is small, holding about three to four gallons. The walls of the stomach are composed of three coats, the outside or serous membrane, the middle or muscular membrane, and the inner or mucous membrane, which is a continuation of the membrane of mouth and esophagus. When the stomach is empty, the inner coat is in loose folds, and there are found small openings in it through which gastric juice enters from the secreting glands. This juice aids in the process of digestion. The middle or muscular coat consists of muscular fibres which in action give the stomach a sort of churning motion,

rolling the food around and mixing it with the gastric juice. There are valves at the entrance and the exit of the stomach to prevent a return of food to the gullet, or to allow coarse, undigested food to enter bowels. Large ligaments hold the stomach in place, and it is well supplied by blood vessels and nerves. In the horse stomach, the digestion of food takes place quickly in comparison with other animals. After the food has been fully digested in the stomach it is changed into what is called chyme, and in this form passes on to the bowels.

The Bowels or Intestines.—The bowels or intestines are divided into large and small, the two, however, forming a continuous tube with winding convolutions, their length being in the average horse about ninety feet, of which the small bowels are about three-fourths the total length. The coats are similar to those of the stomach. The outer one secretes watery fluid that lubricates the bowels and prevent irritation from contact with the abdominal walls; the middle or muscular coat has the faculty of contracting and relaxing, forcing the contents onward toward the anus and mixing the food with the juices; the mucous membrane contains small structures that absorb the nourishment from the food after it is completely digested by the juices of the liver and pancreas, and the glands of the mucous membrane, pouring it into the blood, which, by the action of the heart, carries it to all parts of the body. About six inches from the stomach in the bowels are found two openings, one for the hepatic duct, which carries the bile from the liver, and the other for the pancreatic duct, which carries a clear fluid from the pancreas, called pancreatic juice. These act on the food from the stomach, changing it as stated above.

The first part of the large bowels is known as the blind gut and is about three feet long; its use is to act as a reservoir for water and fluid parts of food. The next part of the large bowels is known as the great colon; it is about eleven feet in length, eight to ten inches in diameter and lies on the floor of the belly, being doubled on itself three times, forming four portions; it is the largest portion of the tract, holding about eighteen gallons. Here digestion of the food is completed, the bowel contracting and

working, it takes out the nutriment, from here the contents are carried into what is called the floating colon, which is about ten feet long and about two inches in diameter; it is thrown into folds and has the office of working its contents into balls, which are then emptied into the rectum. It is suspended from the back bone by a curtain, and lies largely in the left flank.

The Rectum.—This is the last part of the intestines, is about eighteen inches in length, and is sometimes termed the straight bowel. The coats are a continuation of those of the large bowels, but the walls are very much thicker. Above this bowel are the bones of the croup; below in the horse is the bladder. In the mare are found the womb and vagina or passage out, and at the sides are the bones that help to make the pelvic cavity. It is the receptacle for the feces passed on from the colon, which when full, is discharged by the contraction of its muscular coat, and the dilation of the anus or the posterior opening of the alimentary canal.

THE LIVER.—The liver is the largest secreting gland of the body, weighing from ten to twelve pounds; it is situated between the stomach and the diaphragm and is held in place by several strong ligaments; is dark brown in color and secretes a fluid known as bile, which is greenish in color and bitter in taste. The horse has no gall bladder, but simply a tube that allows the bile, as fast as formed, to flow directly into the small intestines about six inches beyond the stomach. It is well supplied with blood vessels and nerves. The bile is an important digestive fluid.

THE PANCREAS.—The pancreas is an elongated, lobed gland, which lies across the stomach and in front of the kidneys; it is a reddish cream color, and closely resembles salivary glands; the pancreatic juice which it secretes, and pours out into the small intestines just back of the stomach, is a clear, colorless alkaline fluid resembling the saliva, and it aids in the digestive process.

THE SPLEEN.—The spleen is a soft, greyish-red organ, situated on the left side of the stomach, and closely attached to it.

It has no ducts for the secretion of any fluids, and its purpose is not well understood, but is thought to regulate the temperature of the stomach during digestion, and to act as a reservoir for the blood. It weighs from two to four pounds and is well supplied with blood vessels and nerves.

THE MEMBRANES.—The muscles are enclosed and bound in their places by a white, thin, tendon-like tissue called fascia; the surface tissue varying in thickness in different parts of the body, separating muscle and skin and protecting the structure beneath, besides conserving the heat of the body—fat being a poor conductor. The deep tissue not only encloses the body of each muscle in a sheath, but it becomes united to and blends with the covering of the bone—the periosteum.

The mucous membranes line all open cavities of the body, as for example, the digestive organs, the breathing organs, the urinary and the genital organs. In the mucous membranes are a large number of glands which secrete a somewhat vicid fluid, called mucus; this keeps the membranes moist. When the membrane is diseased the mucus is secreted abnormally and a discharge is the result, or, it is not secreted sufficiently and the membrane becomes dry and irritated.

The serous membranes, so called because they secrete serum, a lubricating fluid, line the cavities of the body that do not communicate with the air. This membrane is made up of two coats, the inner one attached to the organs in the cavity and the other forming the cavity lining, as for example: the belly cavity is lined and the bowels covered with a serous coat called the peritoneum. Another that lines the chest cavity and covers the lungs is called the pleura.

THE SKIN.—This is the membrane that covers the body and consists of two parts—the epidermis or outer layer, and the dermis or true skin beneath. The epidermis is the outer layer of the skin and is composed of minute cells or scales, its office being to protect the under layer from injury, becoming especially thick where the skin is exposed to friction. This layer has no nerves and is insensible; there is a constant change going on, the dry scale thrown off being known as dandruff.

The dermis or true skin lies beneath the epidermis, and is made up of a network of tissues, vessels and nerves. What are known as the sweat glands are found in this layer. Being supplied with nerves of touch, it is highly sensitive, while at the same time it protects the terminations of the nerves that supplies it. It is a bad heat conductor, and thus serves to retain the heat of the body; it throws off waste matter through the sweat glands, the sweat playing an important part in regulating the temperature of the body; absorption sometimes takes place from its surface. The sebaceous or oil secreting glands are also found in the skin; they furnish fatty matter that keeps the hair soft and sleek.

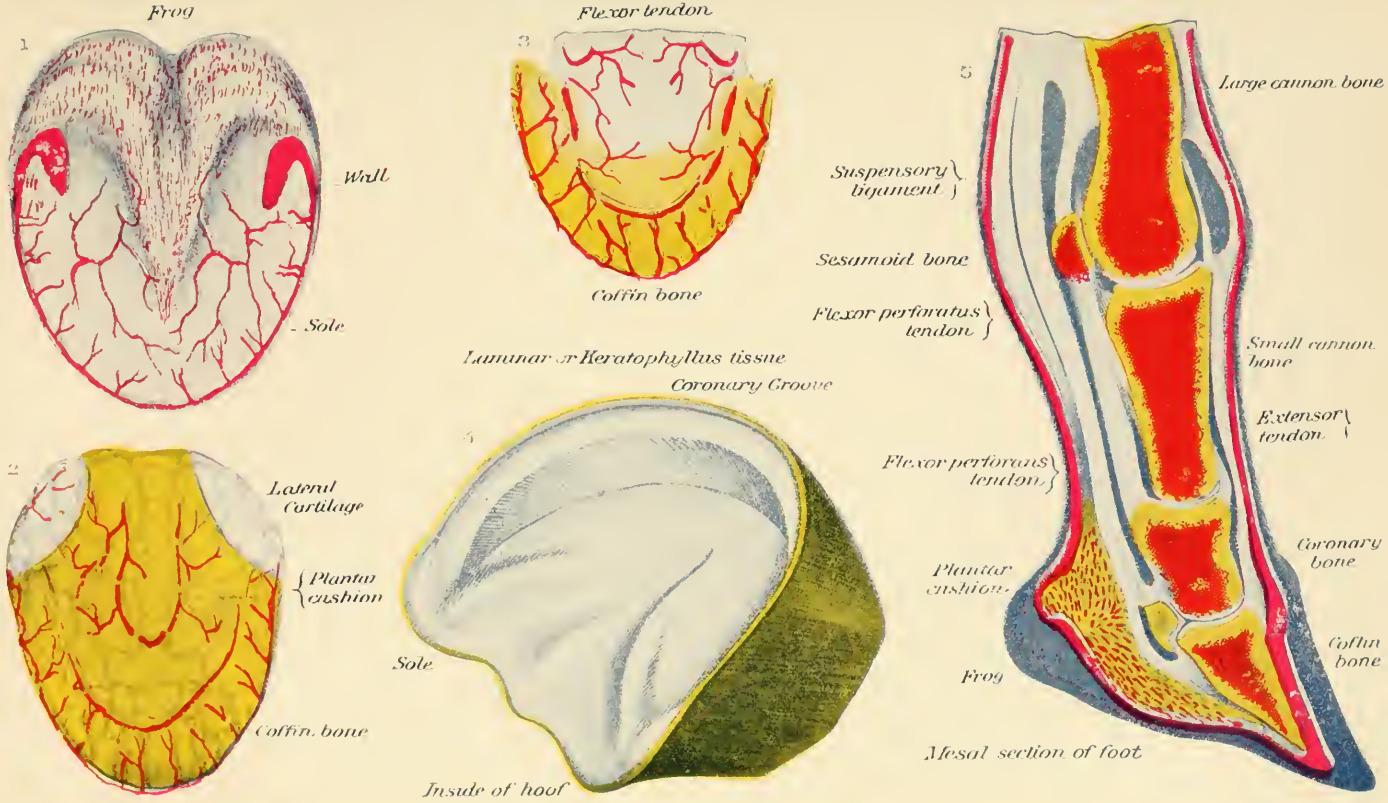
THE HAIR.—The hair is the clothing of the horse, and is found in three forms; the common, which covers the body of the animal being the finest. That of the mane and tail is coarse and long, while a third that is stiffer is found around the muzzle, and is sometimes called "cat hairs." The condition of the horse is shown by his hair; when well, it will be sleek and glossy, while in disease, it will be dry, harsh, and staring. In the spring the old coat is shed, a new one being ready to take its place; and as the hot weather comes on, this is also shed in part. As the cold weather again approaches a new suit of hair, thicker and coarser, begins to appear.

THE EYE.—Something has been said of the eye in the description of bone, muscle and nerve, but a little might be added that would be instructive and of interest. The eye of the horse is a roundish body, flattened behind, mostly enclosed in its bony cavity and membranes. It is made up of several coats around the outside, and the interior of what are called the humors of the eye—the same being three transparant media through which the light rays pass, and are respectively liquid, semi-solid and solid. The solid one is the lens, which resembles in shape the lens of a camera, and forms a picture on the retina the same as the lens does on the plate. On the inner side of the coats is a thin membrane called the retina, which receives the impressions of objects and transmits them to the brain through the optic nerve which terminates in it. The oblong opening is known as the pupil of the eye, and has the power of dilation and contraction,

thus adapting the eye to light received. At the back of the eye are several muscles attached to the eye and to the bony cavity, the uses of which are to move the eye and hold it in place. At the front are the two movable curtains called eyelids, which serve to open and close, and to protect from injury, aided by the eyelashes. At the inner angle of the eye may be seen what is known as the haw, or winking cartilage, the office of which is to assist in removing foreign bodies from the front of the eyeball. In the corner of this angle is a duct that leads to the nose, which conducts the tears of the eye to the nasal passages. A small gland above the outer part of the eyeball, secretes the tears that flow over the eye, keeping it lubricated.

THE EAR.—The ear of the horse is divided into several parts. The inner part or drum is situated in the petrosal or hard bone of the head. The auditory nerve (from the Latin audire, to hear) terminates in small structures just inside the drum of the ear and conveys the sound impressions received to the brain. From the drum is a small opening outward to the external ear, which is made of cartilage to give it stiffness. This is covered with a fine delicate skin and covered with soft, fine hair. Long hair pointing outward fills the external ear, its purpose being that of protection. The muscles of the ear have been mentioned in the muscular system.

THE HOOF.—The hoof of the horse is divided into three distinct parts—the wall, sole and frog. The wall is that part of the hoof that is visible when the hoof rests on the ground, and is divided into the toe, the quarters, the heels and the bars. The toe forms the front of the hoof, the quarters are the sides, and the heels make up the back part. The wall is thickest at the toe and decreases in thickness from the front, being much thinner at the sides. From the heel is a process of hoof which looks like a bar, passing forward between the frog and the sole, one on each side, acting as a brace to the heel and to the quarters; these are called "bars." In a state of nature the walls are covered with a fine membrane called periople, that gives the hoof a polished look. Its office is to prevent evaporation and cracking of the horn—a fact



ANATOMY OF FOOT.

often overlooked in shoeing when the smith rasps it away too freely. Around the top of the wall where it unites with the skin is the coronary band, which is that portion of the skin from which the wall of the hoof grows. Within the wall are the coffin, navicular and part of the small pastern bones, also the quick or sensitive laminae, plantar cushion, and lateral cartilages.

The sole of the foot is a thick plate of horn shaped like the circumference of the foot, except that a V-shaped opening is left behind for the reception of the frog, and is concave on the lower surface. It is produced by the velvety tissue, a thin membrane covering the inferior surface of the coffin bone. The horn of the sole differs somewhat from that of the wall in construction.

The frog is the prominent elastic horn found in the V-shaped notch in the back part of the sole, and is attached to its borders. It is wide at the back, helping to form the heels, and the point of it in front is called the apex. Between the frog and the bars on either side are the commissures, and on the upper part is the membrane known as the sensitive frog, which attaches the frog to the tendon which lies above.

The office of the frog is to destroy shock and to prevent slipping.

THE ORGANS OF RESPIRATION OR BREATHING.—These comprise the nostrils, chambers of the head, larnyx, pharynx, windpipe, bronchial tubes and the lungs.

The Nostrils are the two openings, one on each side of the nose, held open by the aid of cartilage and muscles. About one and one-half inches up the nostril, on under side, is a small shot-like opening which is the terminal of the eye duct, which carries down the tears that lubricate the eyes. The nostrils are lined with a thin, delicate skin, that changes to the mucous membrane as it passes into the head chambers. Above the nasal openings are what are called false nostrils.

The Nasal Chambers give passage to the air from the nostrils to the pharynx, and are separated by a partition of cartilage or gristle, each chamber again being divided into three continuous compartments by thin bo *y* plates, called turbinated bones. The

nasal chambers open into the pharynx, the cavity which is common to both digestive and respiratory tracts and is described with the digestive organs. On account of the formation of the large, soft palate at the back of the mouth, the horse can breathe only through the nose.

The Larynx is situated between the lower jaw bones, just back of the root of the tongue, is box-like, made of cartilage, gives passage to the air and is also the organ of voice. It has an opening on the upper side guarded by a valve, which is open except when the animal is swallowing food or water. The lining is so delicate that the smallest particle of food dropped into it from the pharynx, causes a violent fit of coughing. It is retained in place by the windpipe, muscles, and bones to which it is attached.

The Windpipe, or Trachea, is the tube which carries the air from the larynx to the bronchial tubes and the lungs. It is composed of forty to fifty rings of cartilage united by strong, elastic ligaments, which give the windpipe its flexibility, so that it can be bent in any direction. It is lined with mucous membrane. It can be readily felt in the front of the neck, the upper end being very superficial.

The Bronchial Tubes and Air Cells.—The bronchial tubes are of the same composition as the windpipe, but only about half the size. These, after they pass into the substance of the lungs, break up into other smaller tubes which pass all through the lungs, terminating in what are known as air cells. A very thin mucous membrane, which is a continuation of that of organs already mentioned, lines all these parts. Just inside this membrane is found the capillary net-work of the lungs, and while the blood from the heart is slowly passing through these capillaries it gives off to the air the carbonic acid gas, and absorbs the oxygen from the pure air while it is in the lungs. The object of the system being to purify the blood in this manner.

The Lungs are the essential organs of respiration. They consist of two—right and left—spongy masses, commonly called "lights" and are situated in the chest cavity. On account of the

heart occupying a hollow in the left lung the right is the larger, and is also the more frequently diseased. They are separated by a partition called the mediastinum, and also by the heart, by large blood vessels, and by the esophagus which passes on the way to the stomach. The structure of the lung is a light, soft, but strong and elastic tissue, and is full of air cells and tubes. Externally the lungs are covered by the pleura or serous membrane also lining the chest cavity. Healthy lungs float in water, and are of a rosy, flesh color, marked by irregular marbling or mottling. The lung of a fœtus which has never respired will sink, but when once inflated will float, if healthy, as stated. This may be made useful in determining whether a foal was born dead or died after birth. The lungs are well supplied with blood vessels and nerves.

Breathing consists in first drawing in the pure air, and in forcing the impure out. The first act is caused by the contraction of muscles of the chest in such a manner as to enlarge the chest cavity, and on account of the space between lungs and chest walls being air tight, the lungs enlarge and the air rushes in to fill the space. These muscles then relax and others contract so as to close the chest cavity, making the lungs smaller and forcing out the air.

THE URINARY ORGANS.—The urinary organs consist chiefly of the kidneys, ureters, bladder and urethra.

The Kidneys.—These are two in number and are situated on the right and left of the spinal column, just beneath what is termed the loins or small-of-the-back. The right one is farther ahead than the left, lying beneath the last rib. These organs are full of tubes which excrete the urine from the blood while it is passing from the kidneys, this being their function.

The Urine, the fluid excreted by the kidneys, consists of water, but holding in solution a varying quantity of earthy salts and a peculiar nitrogenous substance known as urea, which if not carried out of the system acts as a blood poison.

The Ureters.—These are the tubes which carry the urine from the pelvis of the kidney down to the bladder. There are two of them, one from each kidney, passing back on each side of

the hip cavity close to the walls. They enter the upper back part of the bladder close together. They are about the size of a straw.

The Bladder.— This is situated in the pelvic or hip cavity, lying on the front part of its floor. It has a body and neck, the body being in front with neck to the rear and in connection with the urethra. The bladder is made up of three coats, a serous, a muscular and a mucous, somewhat similar to the bowels. The outer, serous, is a continuation of the lining of the belly cavity, the inner mucous. When the bladder is empty it is thrown into folds. The muscular coat has the power of contraction, thus emptying the bladder when full. The office of the bladder is to act as a reservoir for the urine, and when full, the nerves of the wall are acted on in such a manner as to cause the contraction spoken of and consequent emptying of the bladder. The neck is guarded with a muscular valve which prevents passage of urine except when the bladder contracts.

The Urethra is the tube that carries the water from the bladder to the outside. In the mare it is very short, passing from the bladder along and below the womb and vagina or passage from womb to the vulva, and it opens up onto the floor of the vulva from four to six inches from the outside. The opening can be felt by the finger upon examination. In the horse the urethra is a great deal longer; from the bladder it passes along below the rectum to just below the anus; here the tube bends downward and forward, passing into and down to the end of the penis. In the horse this tube is used in connection with the organs of reproduction.

THE GENERATIVE ORGANS OF THE HORSE.— The principal organs of generation in the horse are the testicles and the penis.

The Testicles are two in number and lie in a double pouch called the scrotum. In fetal life they are at first situated in the belly cavity near the kidneys, but about the time of birth they descend to the scrotum through what are termed inguinal rings—openings at the back part of the muscles of the belly—where

they are attached to the under part of the hip bones. The testicles are oval glandular organs and their office is to secrete the semen. Lying upon the top part of each testicle is a narrow flattened body called the epididymis. The substance of the testicles is made up of small tubes, these finally uniting into a few tortuous tubes to form the epididymis. The vas deferens is formed by a union of the tubes of the epididymis and is the excretory duct of the testicles. It ascends along with other structures which together form the spermatic cord, the cord attaching the testicle to the body.

The spermatic cord, one for each testicle, is composed of arteries, veins, lymphatics, and the vas deferens, and extends from the internal inguinal ring, where its component structures are collected together, through the inguinal canal, and into the scrotum, where it terminates by attaching to the testicle. It is cut in removing the testicle. The vesiculae seminales are two reservoirs situated upon the upper back part of the bladder; they receive the semen from the vas deferens which open into them, one into each. They secrete a fluid which is mixed with that from the testicles. During the act of copulation the semen is expelled from here by contraction of the walls through the ejaculatory ducts into the urethra. The ejaculatory ducts are two very short tubes connecting the two vesiculae seminales with the urethra. The urethra is the tube that extends from the neck of the bladder to the point of the penis. It is common to both urinary and generative systems.

The semen, or seminal fluid, is the generative product of the horse. Under the microscope it is found to contain numerous small living forms called spermatozoa, and when one of these meets the ovum of the female after copulation, it germinates, and from the ovum thus fertilized the fœtus develops, the development taking place in the womb.

The Penis is the organ of copulation and may be divided into root, body, and extremity or glans penis. The back part of it is attached to the under surface of the pelvic bones. The substance is formed of what is called erectile tissue, which under certain conditions becomes distended with blood. The urethra

passes along the under side, and acts as a conductor for both the urine and the seminal fluid. The glans penis, or extremity, is an enlargement of what is called the corpus spongiosum. The sheath is a loose process of skin which invests the free part of the penis; it forms a wrinkled and folded sack, and extends from the scrotum, with which it is continuous, to a varying distance forward. The sheath covers and protects the penis except during erection; the erection is simply due to the excessive filling of the penis with blood.

THE GENERATIVE ORGANS OF THE MARE.— The female organs of generation may be divided into the ovaries, with their ducts, the womb or uterus, the vagina or passage from the womb, and the external part which is called the vulva.

The Ovaries correspond to the testicles of the horse; they are about the size and shape of a pigeon's egg; are held in place by ligaments and are a little behind the kidneys. At the back part each has a tube leading from it to the womb, called the Fallopian tube. Beneath the coat of each ovary lies what are called the graafian vesicles. Each of these sacs contain a fluid, and an ovum; the fluid increases in quantity and the vesicle grows, and finally the wall of the ovary and of the sac gives way and the ovum or egg escapes into the Fallopian tube and through it into the womb.

The Uterus, or Womb, is a muscular, membranous sac or pouch in the hip cavity between the bladder and the rectum, and is the organ in which the development of the young, or fœtus, from the ovum takes place. It is divided into what is known as the body and two horns, the horns projecting forward from the body; the back end of the body is restricted and forms the neck; it is a small organ, being only about six to eight inches in length and a couple of inches in diameter when animal is not pregnant. It is lined with mucous membrane and liberally supplied with blood vessels and nerves. It is held in place by strong ligaments attached to the sides and from there to the hip bones; these are called broad ligaments. At the back of the womb the neck opens into the vagina, the opening being called the mouth of the womb.

The Vagina is a membranous canal extending from the womb or uterus to the exterior part or vulva, and is situated between the rectum and bladder. It is made up of two membranes, one muscular and the inner mucous. It is small at the outer part, but widens at its inner portion and surrounds the neck of the womb. It receives the penis during the copulation, and forms the passage of the fœtus at birth.

The Vulva is the external opening of the organs of generation and urination, and is situated immediately below the anus. It is made up of two lips and a short canal leading forward from them In the inferior angle of the organ, in a depression on the floor, lies what is called the clitoris; it is similar in structure to the penis in the male, and becomes erected in copulation and after urination. The urethra opens into the passage about four to six inches from the external opening.

The Hymen is an incomplete partition or membrane which separates the vulva from the vagina, lying immediately before the urethral opening. It is ruptured during the first act of copulation.

The Mammary Glands, or Udder, are two glands situated between the thighs of the mare, the use of which is to secrete and hold milk for the nourishment of the new born animal. The glands are covered with a smooth, thin skin, and the substance of them is filled with small glands and tubes. The glands are liberally supplied with blood, from which, by some mystic touch of nature, the milk is formed, and is conveyed to the young through teats on the under side of the glands, the ends of which are pierced by several holes for its escape.

ANATOMY OF MAN AND HORSE COMPARED

THE bony structure of the horse, when carefully compared with that of man, does not reveal those differences that one from superficial review might think existed. As long ago as the days of Aristotle the question had been given some study, and that wise man was enabled to state, that though the horse was a hoofed and apparently a single-toed animal, he nevertheless had the rudiments of toes enclosed in the flinty hoof which developed around the foot and protected it from the rough soil over which the animal traveled. And the parallel, when once found to exist in the foot of the man and the horse, is easily extended to all the other parts of the skeleton. In the table given below, the names of the different parts of the limbs of man and of the horse are given in parallel lines, so that one may see at a glance, those exactly corresponding, though called by different names.

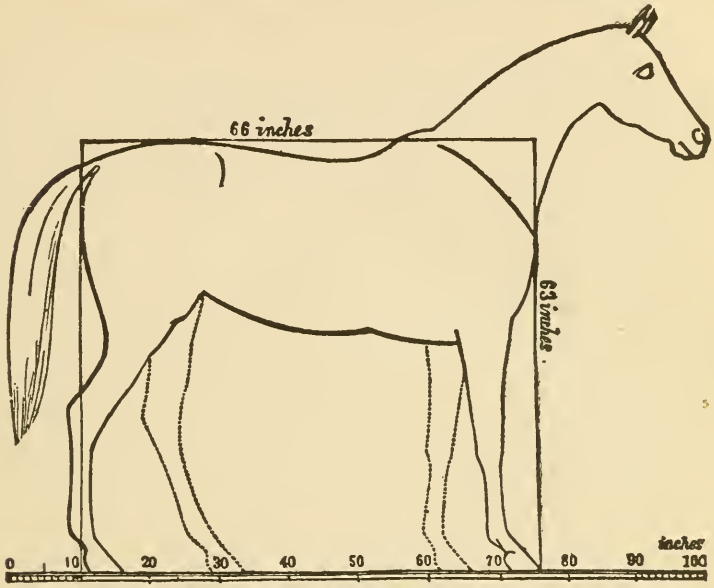
FRONT LIMBS.

MAN		HORSE
Arm (Humerus)	corrresponds to	Lower bone of the shoulder (arm).
Forearm	" "	Forearm.
Wrist	" "	Knee.
Hand (Metacarpus)	" "	Cannon and splint bones.
Knuckles	" "	Fetlocks.
Fingers	" "	Pastern and foot.

HIND LIMBS.

Thigh (Femur)	corresponds to	Upper bone of the thigh.
Knee	" "	Stifle joint.
Shin bone	" "	Lower thigh or gaskin.
Ankle	" "	Hock.
Foot (Metatarus)	" "	Leg, back cannon.
Ball of the foot	" "	Fetlock.
Toe	" "	Pastern and foot.

PROPORTIONS OF THE HORSE



Scale of Measurements.

To assist in judging horses we give an outline indicating the proportions of the several parts. In making this chart, the average of six horses of perfect symmetry is combined. And while this will not apply to draft horses, the nearer horses of general utility come to the measurements the better they will be.

	INCHES.
Height	63
Length from shoulder-point to quarter	66
Lowest part of chest to the ground	36
Elbow point to the ground	39
Withers to poll just behind the ears, in a straight line	30
Same measure along the crest	32
Length of head	22
Width across the forehead	9½
From withers to the hip	22
From stifle to point of hock, as in attitude of chart	27
Root of tail to stifle joint	26
Point of hock to the ground	22½
Fore arm from elbow to trapezium bone (rear bone forming articulation of the knee)	19½
From trapezium bone to the ground	19½
Girth varies from	78 to 79
Circumference of the fore cannon bone (large metacarpal or shank bone extending from the knee to the fetlock)	7½ to 9
Circumference of the fore arm just below the elbow	16½ to 18

WATER AND WATERING

IT is generally held, at least in practice, that any water that stock can be induced to drink, is sufficiently pure for their use. This practice occasions losses that would startle us if statistics were at hand. Water that is impure from the presence of decomposing organic matter, such as is found in wells and ponds in close proximity to manure heaps and cess-pools, is frequently the cause of diarrhea, dysentery, and many other diseases of stock, while water that is impregnated with different poisons, and contaminated with specific bacteria, produces death in very many instances. Smith, in his "Veterinary Hygiene," classes spring, deep-well water and upland surface water, as "wholesome;" stored rain water and surface water from cultivated land, as "suspicious;" and river water to which sewerage gains access, and shallow wells, as "dangerous."

The practice of depending on scooped out water holes, to be supplied with rain water, as is the case in some states, is decidedly objectionable. Pure water is clear and without taste or smell; much beyond that the ordinary individual cannot go in determining water qualities, but he can use all ordinary safeguards to insure his animals getting water such as he would wish to drink.

Considering the quantity that may be required by the horse, it may be said that when animals have access to water continually, they never drink to excess. When the horse is placed where he has to depend upon his attendant for his water supply, it may be stated, in a rough way, that he requires about eight gallons of water daily, the amount varying with the character of the food given, the weather and the work.

The time of watering should be carefully studied. The horse should be watered at least three times a day; when at work, oftener, if conditions are such as to make it possible. There is a popular fallacy that if a horse is warm he should not be allowed any water, many claiming that the first swallow of water "founders" the animal or produces colic. This is erroneous. No matter how warm a horse may be, it is always safe to allow

him from six to ten swallows of water, but a large quantity at this time is harmful. If this is given on going into the stable, he should be given at once a pound or two of hay and allowed to rest about one-half hour before watering more and feeding grain. When water is now offered him, it will in many cases be refused, or at least he will drink sparingly. The danger is not in the "first swallow," but in the excessive quantity the animal will drink when heated, if not restrained.

Water should not be given ice-cold. In winter the water-troughs should stand in sheltered places and where the sun can shine on the water, or the chill removed with tank heaters.

Water should always be given before feeding, unless the animal is too warm, in which case a little hay may be given, and then watered as soon as rested. If watered after a full feed the stomach is distended, and digestion interfered with. Water needs no digestion and if given before feeding passes rapidly from the stomach; this organ, being small, its entire capacity is needed for the proper digesting of the food.

FOOD AND FEEDING

HAY.—The best hay for horses is mixed clover and timothy, from one-half to two-thirds clover. It should be of a greenish color, crisp, clean, fresh, and possessing a pleasant aroma. Even this, if kept too long, loses part of its nourishment and becomes hard, dry, and indigestible. New hay should be fed with care, as it is difficult to digest, and produces much slavering, and occasionally purging and irritation of the skin. At first it is well to mix it with old hay. The second crop, or aftermath, is not considered good hay for horses, but prized by some as a food for milch cows, they claiming that it increases the flow of milk. Hay should be cut when in full flower, before the seeds fall; it becomes dry and woody, lacking

nutrition, if left longer. It should remain in the field the shortest possible time, for if left too long in the sun, it loses color, flavor, and wastes. There can be no fixed time for curing, as conditions of weather govern, but, in order to preserve the color, aroma and best quality, it should be gathered as quickly as is possible. On the other hand, hay will spoil in the mow if not sufficiently cured, and the last state is worse than the first, for, as before stated, musty and moldy hay is productive of many disorders.

The average horse, getting grain, should be allowed from ten to fifteen pounds of hay daily, but it is an error to think that horses at light work can subsist entirely on hay, for such animals will become pot-bellied, fall off in flesh, and will not thrive. Colts will grow up on a hay diet solely, into long, lean, gawky creatures, never making as good horses as those accustomed to grain in addition to hay.

STRAW, if used at all, should be cut and mixed with hay, and ground or crushed grain. Wheat, rye, and oat straw are the ones most used, and of these the oat straw is the best. Pea and bean straw are sometimes fed to horses, the pea being preferred.

CHAFF.—Wheat and rye chaff should never be used for horse feed. The beards get lodged in the mouth and throat, and produce more or less serious trouble. In the stomach and bowels they often serve as the nucleus for "soft concretions," as spoken of in diseases of those organs. Oat chaff, if fed in small quantities and mixed with cut hay, or corn fodder, is much liked by horses. Troublesome and sometimes fatal diarrhea follows, in some instances, the practice of allowing horses and cattle free access to a pile of oat chaff.

GRAINS.—Oats take the precedence of all single grains as a food for horses, as the ingredients necessary for the nourishment of the body exist in them in the right proportions. They are, besides, more easily digested, and a larger proportion absorbed and converted into body tissue. The best oats are six to twelve months old, plump, hard, clean, bright and sweet. New oats are indigestible; kiln dried oats are to be refused as a rule, for the

drying process injures them. Sprouted or fermented oats should never be fed. Crushed oats are the best for old horses and those having bad teeth. Horses that "bolt" their food are best fed on crushed oats, and out of a manger large enough to allow spreading the grain in a thin layer.

A mixed grain ration, composed of a mixture of oats, corn and bran is better than any single grain; a mixture of two parts each of corn and oats and one part bran, by weight, is good, or equal parts of each. During very hard work the addition of from one-half to one pound of linseed meal or gluten feed to each ration is of great value.

The average horse requires, in addition to his hay ration, from four to twelve pounds of grain daily, depending upon the amount of work being done. The best oats are cut about one week before being fully ripe. Not only is the grain richer in nutritive properties, but there is less waste from scattering than if left to become dead ripe. Moldy oats, like hay and straw, are productive of digestive diseases.

Wheat and rye are not to be used as food for horses except in small quantities, bruised or crushed, and fed with other grains or hay. If fed alone in any considerable amounts, they are almost sure to produce digestive diseases, founder and like troubles. They should never constitute more than one-fourth of the grain allowance, and best be ground.

Bran of wheat is an excellent food for horses. It should not be depended upon and given alone, but should be fed with other grains. It keeps the bowels free. If sour, it should not be used, as it will disorder the stomach and intestines and may produce serious results. It is better to make it a part of each day's ration than to feed it once or twice a week as is so often done.

Corn is not a suitable grain as exclusive food for young horses especially, as it is deficient in mineral salts. It may be fed either whole or ground. If fed whole, feed on the cob. Horses unaccustomed to corn should be fed in small amount at first, gradually increasing the amount; otherwise an attack of indigestion may result.

Linseed, ground, is occasionally fed with other food to keep the bowels open and improve skin conditions. It is particularly

good during convalescence, when bowels are sluggish in action. Linseed tea is very often given in irritable conditions of the digestive tract.

ROOTS.—Potatoes are used for horse food in many sections. If fed raw and in large quantities they are apt to produce indigestion. Their digestibility is favored by steaming or boiling. In common with other roots they are slightly laxative. Beets are not much used for horses. Carrots make excellent food, especially during sickness. They improve the appetite and slightly increase action of bowels and kidneys; improve the coat, and some claim that chronic cough has been cured by their use. They may be considered as an adjunct to other foods, and fed in small quantities with benefit.

GRASSES.—Grass is the natural food of horses. It is composed of a great variety of plants, differing widely in amount of nourishment contained, some being almost without food value, and others eaten only when nothing else is obtainable. Some are injurious and even poisonous. None of the grasses are sufficient to keep a horse in work. Horses thus fed are "soft" sweat easily, purge, and soon tire on the road. To growing stock it is indispensable, and it acts as an alterative to horses that are fed on hay and grain. It must be fed to grain and hay fed animals in small amounts at the outset. The stomach and bowels undergo rest, and recuperate, if the horse is turned to grass for a time each year. During febrile diseases grass acts almost as a medicine, lessening fever and favoring recovery; wounds heal more rapidly than when on grain, and some chronic diseases disappear entirely when at grass. If fed to him it should be fresh cut, but where possible he should be allowed to crop it himself; thus enjoying not only the herbage in its native condition, but the air, and sense of freedom as well.

PREPARATION OF FOODS.—Foods are prepared for feeding for any of the following reasons: To render it more easily eaten; to make it more digestible; to economize in amount; to give it some new quality; to preserve it.

The different grains are more easily eaten when ground, crushed, or even boiled. Rye or wheat should never be given whole, and there is less waste when corn is ground; and again, corn in common with other grains is easier digested than when fed whole. Hay and fodder are economized when cut in short pieces. Not only will the horse eat the necessary amount in less time, but it will be found that there is less waste, and the mastication of grains—whole or ground—fed with them is assured. Feeding the grain mixed with cut hay or fodder is a good way to feed horses that bolt their food.

One objection to feeding cut hay mixed with ground or crushed grain and wetted, during the hot months, must not be overlooked. Such food is apt to undergo fermentation unless fed at once, and the mixing trough even, unless often scalded and cleaned, becomes sour, and enough of its scrapings are given with the food to produce wind colic. A small amount of salt should always be mixed with such food.

Improper feeding and watering doubtless accounts for over one-half the digestive disorders met with in the horse, hence the reader cannot fail to see the importance of having some proper ideas concerning these subjects.

In this land, horses are fed chiefly on hay, grass, roots, oats, corn, wheat and rye, and many think they could subsist on nothing else. We are told, by authority, that in some sterile countries horses live on dried fish, and even vegetable mold. In Arabia they are fed on milk, flesh-balls, eggs and broth; while in some of the countries of the far east, salt, pepper, and other spices are made into balls with flour and butter, and these are supposed to produce animation and to make a fine coat.

In the selection of food for horses, we should remember the arrangement of the digestive organs, as well as the functions of each. Food must be wholesome, clean and sweet; the hours of feeding regular; the best methods of preparing adhered to; and cleanliness observed in both the preparation and the feeding. The length of stomach digestion varies with different foods. Hay and straw pass out of the stomach quicker than oats. For this reason oats should be given after hay, for if reversed, the hay will carry the oats out of the stomach before being fully acted

upon, and indigestion is the result. Another reason why hay is best first, especially if hungry, is that it requires more time for mastication and cannot be bolted as are the grains. Water should never be given soon after eating, as it washes the food from the stomach, before it is ready for intestinal indigestion.

The stomach begins to empty itself very soon after beginning to eat, and continues rapidly during the meal. Afterward the passage is slower and several hours are required for the stomach to empty itself. The work to be done, should direct in food selection. Rapid or severe labor cannot be done on a full stomach. Horses doing work of an exhausting character, should be fed small quantities, and about two hours before going to their work. Even slow work horses should not be fed bulky, innutritious foods in large measure, just before going to work. The small stomach of the horse would seem to lead us to the conclusion that he should be fed in small quantities and often, which in reality should be done. The disproportion between size of stomach and amount of water drank tells us that the horse should be watered before feeding. Feeding too soon after a hard day's work is one of the common errors of feeding, and one that produces more digestive disorders than any other. A small quantity of hay may be given, but grain should not be given for one-half hour or more. The same rule holds for horses that have fasted for a long time; for if allowed to eat too much the stomach becomes engorged, its walls paralyzed and colic is sure to follow. Horses should be fed three or four times a day; nor will it do to feed concentrated food alone. Bulky foods must be given to detain the grains in their passage through the bowels; bulk also favors distension, and thus mechanically aids absorption. To horses doing slow work, chopped or cut hay fed with crushed oats, ground corn, etc., is the best manner of feeding, as it gives the required bulk, saves time and half the labor of feeding.

Sudden changes in diet are always dangerous—when making a change of food, do so gradually. A sudden change from oats to a full meal of corn will most likely sicken him. An increase in the usual food must be done gradually. Quantity must be in proportion to work. If a horse is to do less work, or rests

entirely for a few days, give less food. Were this done from Saturday night to Monday, there would be fewer cases of "Monday morning sickness," such as lymphangitis and colic. Foods should also be more laxative in nature when a horse is idle. Don't feed musty or moldy foods; they are the cause of several diseases. Musty hay is thought to produce disorder of the kidneys; and the effect of smutted grasses and grains on pregnant mares is pretty well known.

Do not exercise a horse violently immediately after feeding. The digestive organs require time for digesting the food before the blood is called away to nourish the muscles.

How to Make Mashes.—Take 4 quarts of good bran, moisten it gradually with hot water, then add boiling water to the desired consistency. Cover with a cloth and give to animal when cool enough. A little salt may be added if wished.

Another good mash is made by boiling 2 quarts of ground oats and 1 pint flaxseed and a little salt with plenty of water for three hours. Then mix with it bran enough to be of desired consistency. This is enough for a horse, and when a team has been on dry feed, is good for a Sunday morning meal.

How to Make Gruel.—Stir 1 pint or more of oatmeal gradually into 4 quarts of cold water. Fine cornmeal and flour in equal parts may be substituted when oatmeal is not available. Then fill up the pail in which it is mixed, with water, and give to animal at once. Good for a tired horse.

How to Make Hay Tea.—Fill up a bucket with the best of hay. Pour over it boiling water to fill the pail. Cover and let stand, pressing the hay down occasionally, or set on the stove to keep hot while pressing. In fifteen minutes it will be steeped. Pour off water into another bucket, and add enough cold water to make 6 or 7 quarts. Give to the horse when cool enough to drink. Excellent for tired horses.

THE HORSE

DISEASES AND THEIR TREATMENT

ANTISEPTICS.—Antiseptics are substances applied to wounds or sores to assist in the process of healing by destroying the germs which materially interfere with the process. They are used in solutions, are mixed with some fatty medium, as an ointment, or are dusted on dry in the form of powder. Though commonly called "healing remedies," antiseptics possess no true healing properties; the healing process being accomplished only by the living cells of the tissues. They, however, destroy or prevent the growth of germs, which by gaining entrance to sores and wounds, grow and multiply, irritating the wounds, injuring and destroying the living cells of the animal tissues, and often form poisons that may be taken up by the blood and cause injury or death from blood poisoning. Were it not for germs, no wound would be fatal unless some vital organ was mechanically crippled, and all wounds would heal without complications. Ordinarily, wounds, abscesses, and sores, afford ideal conditions for the growth of germs, and unless carefully treated are swarming with them. The office of antiseptics is to destroy these germs.

Practically all antiseptics are poisonous if used in concentrated form, and would burn and destroy the tissues, consequently they are used in such a strength as will destroy the bacteria without injuring the living cells of the body. To wounds, antiseptics are usually applied in solution, as in this form they penetrate deeper into the wound, and their strength is easily estimated; besides, they often possess other properties than as germicides. They are applied as washes by saturating cotton or other material and placing in or on the wound, and by injecting it, in the case of deep wounds, with a syringe. In general it is more satisfactory to use antiseptics freely and often without disturbing the wound. If they do not prove satisfactory either

GIVING A DRENCH.

See pages 70 and 355.

PLEURISY
Note drawn up or sunken position of abdomen.
See page 91.

SCROTAL HERNIA
See page 182.

PNEUMONIA
Horse has a haggard look, anxious eye and labored breathing.
See page 90.

ACUTE INDIGESTION
See page 110.

SEVERE SPASMODIC COLIC
See page 115.

SPASMODIC COLIC
See page 115.

Inflammation of Bladder
See page 135.

Acute Inflammation of Kidneys
See page 132.

Chronic Inflammation of Kidneys
See page 133.

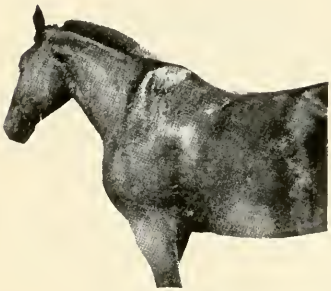
Inflammation of Bowels
Getting down slowly and hesitatingly
—a symptom
See page 118.

Chronic Inflammation of Kidneys
See page 133.

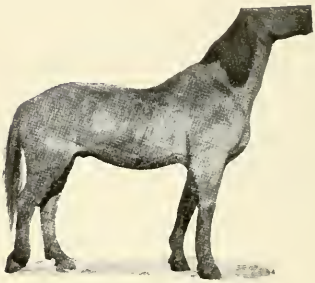
The Way to Poultice the Lungs
As used in lung diseases.

Poll Evil
See page 266.

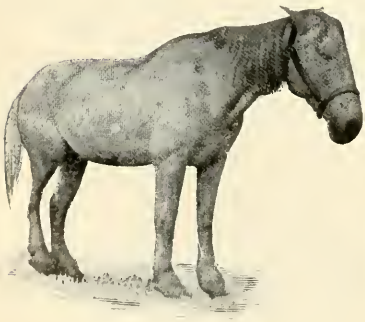
Big Head—side view
See page 251.



Fistulous Withers
See page 268.



Dislocation of the Patella, or Stifled
See page 293.



Stifle-Joint Lameness
See page 293.

Fracture of the Femur
See page 282.

NASAL GLEET—both Nostrils
See page 77.

LYMPHANGITIS—WEED IN-THE-LEG
See page 230.

OPEN JOINT
See page 299.

CAPPED ELBO
See page 281.

Splints
See page 252.

Sprain of Radial Ligament
See General Treatment of Sprains.

Bog Spavin
See page 296.

Enlargement of Fetlocks,
or Wind Gall
See page 291.

Capped Hock
See page 208.

Anchylosis of Fetlock Joint
The natural termination and cure for bone lameness, such as ring bone and spavin, is anchylosis—a stiffening or solidifying of the joint.

Grease Heel
See page 204.

Acute Farcy
See page 194.

Bone Spavin
See page 259.

UPPER ARTICULAR SURFACE OF SMALL PASTERN BONES
Right, healthy; left, ring bone developing.
See page 256

PASTERN AND COFFIN BONES
Left pastern healthy; right, affected with ring-bone.
See page 256.

COFFIN BONES
Left, healthy; right, side bones.
See page 255.

SOLE OF COFFIN AND NAVICULAR BONES
Left navicular, healthy; right navicular, navicular disease.
See page 324.

increase strength or try a different antiseptic. Again, all antiseptics do not work equally well in all cases. In apparently similar wounds the results will not be the same with one kind of antiseptic—one will heal finely and the other make no progress. In unfavorable cases, change the antiseptic.

Corrosive Sublimate, or Bichloride of Mercury, is probably the leading antiseptic. It comes in tablet form, with directions for amount of water in which to be dissolved. The principal objection to this drug is its corrosive effect on metals, and the fact that it is a powerful poison. It should always be plainly labeled, and kept where children cannot get to it. It is generally used in the strength of 1 part Corrosive Sublimate to 1,000 parts of water (1 drachm to 4 quarts) for external application.

Carbolic Acid is one of the most frequently used antiseptics. It is dissolved in water, and used in strengths varying from 2½ to 5 per cent. One part of acid to 30 parts of water is one of the frequently used proportions. For a strong antiseptic or a disinfectant, 1 part of Carbolic Acid to 20 parts of water or a 5 per cent. solution, is used. Pure Carbolic Acid is caustic, and will destroy tissue by burning. Carbolic Acid is poisonous.

Sulphate of Copper, also called "Blue-Stone" and "Blue-Vitriol," is a mild antiseptic and in addition is astringent—tends to pucker the tissues. It can be used in solution in the strength of from 2 to 4 drachms to the pint of water. For certain purposes, as old wounds, it can be made much stronger. When powdered and dusted on a wound, it acts as a caustic; a crystal of it rubbed on a surface acts as a caustic, and is useful to check bleeding. An ointment, to dress old sores, can be made by mixing 1 part finely powdered Blue-Stone and 1 part of Sulphur, with 4 parts of fresh lard or vaseline. This drug is the principal ingredient in the Bordeaux mixture, so much used for spraying.

Sulphate of Zinc, also called "White Vitriol," is an antiseptic and an astringent, and is used in the strength of one part of the Zinc Sulphate to 30 to 60 parts of water, or 2 to 4 drachms to a pint of water. Six drachms of Sulphate of Zinc and 1 ounce Acetate of Lead (Sugar of Lead) dissolved in a pint of water, is a fine remedy and one that is much used in veterinary practice.

It is called "White Lotion." Should be well shaken before applying. Internally it is a poison.

An excellent antiseptic ointment for use on sores or irritated conditions of the skin, is made by combining 1 part of Oxide of Zinc and a little Carbolic Acid with 5 parts fresh Lard or Vaseline. The Benzoated Oxide of Zinc Ointment, in the back part of this book, is also a very fine preparation.

Creolin is a good, cheap and popular antiseptic and deodorizer, and is referred to in many places in this work. It is mixed with water in the proportions of 1 to 3 parts to 100 parts of water.

Powdered antiseptics, as already noted, are much used. Of these, Iodoform is much used for dusting on wounds and sores, but is somewhat barred because of odor and expense. Boric Acid is another good antiseptic that is used in powder form. It may also be used in solution of 20 grains of acid to 1 ounce of water, and in this form it makes an excellent wash for the eye, for the mouth, and for other cavities, as it is practically non-poisonous. Lime, finely pulverized and air-slaked, is extensively used for dusting on sores, harness-galls, and suppurating surfaces, and when so used gives good results.

Antiseptics are applied in ointment form, when the part is hard, dry, and irritated; the combination of fat and medicine seeming to soften and soothe the part. In powdered form, dusted over the surface of a sore, antiseptics are valuable in drying up discharges and keeping the sores dry and free from odor. Sometimes the antiseptic is mixed with some sticky substance, such as pitch or tar, and may be valuable in keeping dirt out of wound; but care must be taken that such applications do not prevent the free escape of pus.

The coal-tar preparations put out by different firms are very good antiseptics. Among these are Zenoleum, Kreso, and others. They are used in the strength of 1 part to 20 to 50 parts of water.

DISINFECTION.—This consists in destroying the germs or virus of a disease. When an animal has been suffering from a contagious disease, it is necessary to disinfect the quarters and

all utensils, instruments, harness and equipment that may have become infected with the disease germs. First, remove all litter, rubbish, and loose material of little value from the stable and burn them. Then thoroughly scrub the walls, floors, ceilings, mangers, pails, and other utensils with a solution made by mixing 1 part of Carbolic Acid with 30 parts of water—about a 3 per cent. solution. When this is dry, walls and mangers may be whitewashed, using the whitewash hot. Corrosive Sublimate, or Bichloride of Mercury, 1 part to 1,000 parts of water (1 drachm to 4 quarts) can be used instead of the Carbolic solution, but must not be used on metal, as it is very corroding. One part of Creolin in 30 parts of water is also a good disinfectant, and has the added good quality of not being poisonous. Don't let Corrosive Sublimate or Carbolic Acid get on food which animals may eat. Bright sunlight is an excellent disinfectant and should be admitted wherever possible. All infected materials, and especially bodies of animals that have died of disease, should be either burned or buried deep, covering with Lime before the dirt is thrown on, to prevent further spread of disease. Dogs, crows, and other animals frequently dig up and carry off parts of carcasses, where burying is not properly done. Infection is also carried by streams of water, by stock cars, and by litter that has been used in the cars.

Fumigating a stable is also a good method of disinfection, and can be used in connection with the foregoing. To have the fumigating effectual, the room must be fairly tight. Sulphur is perhaps the most convenient substance to use for fumigating; Formalin is also used, and is very effectual, but needs a special appliance in order to use it.

To fumigate with Sulphur, fill an ordinary galvanized iron pail half full of ashes or dirt, making the top of the material saucer-shaped; place the pail in a tub of water, having the water come up as high on the side of the pail as possible; put the Sulphur in the pail; when everything is ready, pour over the Sulphur a little wood alcohol, or have under it a few rags saturated with kerosene, the alcohol is better and safer; light the alcohol and leave the stable, closing the door. Burn three pounds of Sulphur to each thousand cubic feet of space; if more than three pounds are required, burn in separate dishes. Leave the building

closed for twenty-four hours, then open, and air out freely. The fumigation will be more effectual if the walls are first well sprinkled with water.

FOMENTATIONS.—These are applications of hot or cold water to a part. The application is generally made for from one-half to one hour at a time, though often for a longer period. The water may be applied as hot as can be comfortably borne, and the temperature can be kept up by adding hot water frequently. The application may be made with sponges, cloths, or even with the hands, while at the same time the part is gently rubbed. The best is to surround the part thickly with woolen cloths and keep these wet. Fomentations should be applied two to three times daily. They are much used to lessen inflammation, pain, and swelling of recent injuries, or for any badly irritated part. They are used with good results in inflammation of the udder and other glands. Cold water is also excellent to relieve inflammation, especially when the part is badly congested. It can be applied with cold, wet cloths, or by allowing cold water to drip upon it by irrigation. In some cases, applying the cold water with considerable force, as a stream from a hose nozzle, and then rubbing briskly, has an excellent effect in toning up debilitated parts and relieving congestion. Cold is also applied to an inflamed part by using a bag of cracked ice.

The principal point in connection with the use of fomentations is that the water should be either hot or cold, lukewarm applications are of no value; and in order to get the most good from them they should be continued for some time, in many cases almost continuously.

NURSING AND FEEDING SICK ANIMALS.—As in the case of human beings, the proper nursing and food has much to do in the recovery of animals from spells of sickness. In the first place, make your animal as comfortable as possible, warm in the winter and cool in the summer. Give him plenty of fresh air to breathe, but avoid drafts in all cases. Woolen blankets in the winter, and linen sheets and nets are needed in summer. Hoods to cover the head and neck are sometimes required in cold

weather. The proper temperature for the stable that is used for sick animals is from 55 to 60 F. In case of weak lambs or sick dogs a room ranging from 62 to 70 F. is better.

The question of drainage is also important, and the location shonld be as high as circumstances will permit.

The food should be simple, clean, nutritious, easy of digestion, by being cooked, changed occasionally and administered often and in small quantities. Give green food when it can be had. Oats, corn, bran, shorts, etc., may be scalded with boiling water, covered and left to steam until cold, and then given. The grain should be ground in all cases if possible. Hay and water should always be given in liberal quantities, and both should be of first quality. Warm milk for calves, and the same diluted and sweetened for lambs and colts; beef tea, raw eggs, porridge of either oat or corn meal and milk for dogs, and the same for pigs will be found the best diet. Bear in mind what has been said about feeding often and in small measure, but be careful not to over-feed, as that may put the patient back and increase fever. Horses, cattle, etc., need to be fed three or four times a day; colts, calves, lambs, dogs, etc., every two to four hours. Fever patients should have water so they can help themselves. Those suffering from diarrhea or excessive purgation should be watered four or five times a day, but in less measure. Plenty of rest should be given sick animals. Many cases prove fatal from being worked too long after being taken sick, or from being put to work too soon after recovering from a spell of sickness.

FORMS OF MEDICINE AND WAYS OF GIVING THEM. — Medicines may be given by any of the following channels: By the mouth; by the air passages and lungs; by the skin; under the skin; and by the rectum.

By Mouth. — Medicines are given in powders, balls, drenches, and electuaries or pastes.

Powders.—These should be finely pulverized in order to be rapidly dissolved and absorbed. They should be free from any irritant or caustic action on the mouth. If agreeable to taste and smell they are readily taken in feed or drinking water.

When placed in the feed, the food should be first moistened and then the medicine mixed in the feed. When mixed dry the horse will often leave the medicine in the manger bottom. If very small they can be placed well back on the tongue. It is always best, when possible, to give in food or drink to avoid worrying the animal.

Balls.—Make into the shape of a cylinder, about two inches long and three-quarter inches in diameter. They should be fresh and mixed with honey, syrup, molasses, or some such agent, using linseed meal, if necessary, to give consistency and body. If necessary to keep some time, use glycerine so they will not harden, or they will lose their virtue. Wrap in oiled tissue paper for ease in swallowing. Gelatine capsules are sometimes used. Balls are best when medicine is disagreeable; when dose is not too large; when horse is ugly to drench; and when medicine is intended to act slowly. Oils or caustic substances should not be given this way.

Balls may be given by "balling gun" or given by hand. Always loosen horse before giving; if tied he may hurt himself or the person in attendance. It is easier, after a little practice, to give without using gag, as the horse does not like force in getting his mouth opened. Grasp the tongue firmly with the left hand and pull gently forward; moisten the ball slightly, and place with the tips of the fingers of the right hand as far back in the mouth as is possible; as tongue is loosened, it is drawn back into the mouth and carries the ball with it. Keep the mouth closed for a moment or two. Always offer water to drink after balling; it may prevent coughing up, or lodging in the gullet

Drenches.—When medicine is given as a drench, only enough oil or water should be used to thoroughly dissolve or dilute it. Insoluble medicines, if not irritating or corrosive, may be put in water, or better, thin gruel; the bottle to be well shaken before giving it. Strong or irritating liquids such as turpentine, croton oil, etc., should be mixed with olive or linseed oil, or milk beaten with eggs.

To administer, put the medicine in a drenching bottle or horn. A champagne or ale bottle holding about a quart, strong,

clean and smooth will answer. A horn or tin bottle is better on account of not breaking. If dose is small, the horse's head may be held up by the left while the medicine is poured by the right hand. The left thumb is placed in the angle of the lower jaw; the fingers spread out in such a way as to support the lower lip. If dose is large, the horse ugly, or the attendant unable to support the head as directed above, then have the head held up by a loop made in a rope, and slipped over the upper jaw just behind the front teeth, the free end being held up by passing through a pulley, or over a beam, or through a ring fastened to the ceiling. It should never be fastened, as the horse might hurt himself. Elevate head enough to prevent horse from throwing liquid from his mouth. The line of face should be raised a trifle more than horizontal, but not much, or it will be hard for horse to swallow. Person giving drench should stand on something in order to reach horse's mouth on a level, or a little above. Introduce bottle at the side of the mouth in front of the molar teeth, in an upward direction. This will cause horse to open his mouth, when base of bottle is suddenly elevated and about 4 ounces of liquid allowed to run out on the tongue as far back as possible, care being taken to keep bottle from between back teeth. Take out bottle, and if horse does not swallow, encourage same by rubbing the roof of mouth with fingers or neck of bottle, occasionally removing them. Repeat, when this is swallowed, and continue until all is taken. If coughing occurs, or if by mishap the bottle is broken, lower the head at once. Don't rub, pinch, or pound the throat, or draw out tongue. Be patient. Drenches must never be given through the nose to a horse. If horse is hard to drench, put a twist on upper lip.

Electuaries, or Pastes, are medicines mostly mixed with licorice-root powder, flour and molasses, or syrup, to the consistency of honey, or a "soft-solid." They are intended chiefly to act locally on the mouth and throat. They are to be given with a wooden paddle, or a strong, long-handled spoon.

By the Nose.—These are administered by the upper air passages and lungs, by inhalation, and the nasal douche. Inhalation is used for volatile medicines, and for medicated steam or vapor.

Medicated vapors are to be inhaled by placing a bucket containing hot water, or vinegar and water, or scalded hay or bran, to which Carbolic Acid, Iodine, or other medicines have been added, in the bottom of a grain bag; the horse's nose is then inserted in the top of the bag, and he inhales the medicated steam or vapor; or better yet, convey the steam from a kettle through a rubber tube to the bottom of the bag. Two large holes should be cut in the bag opposite the nostrils. Care must be taken that it is not too hot. Or inhalation may be effected by putting the head over the bucket, throwing some light covering over the head, but not entirely shutting off air supply.

The "nasal douche" is used in some local diseases of the nasal chambers. Take a piece of one-half inch hose, about one inch from one end wrap a piece of cloth around it a number of times to form a collar a little larger than the nostril. Put a funnel in the other end of the hose; place the end with the collar in the nostril, pressing the collar up against the nostril, elevate the funnel and pour the douche into it; it will fill the nostril, run over the upper end of the partition and come out of the other nostril. Keep the head low when giving a douche.

By the Skin.—Medicines are often applied to the skin, yet care must be observed when applying over the entire skin such remedies as Tobacco water, Carbolic Acid, acid solutions, etc., as poisoning and death have sometimes resulted. Poisonous medicines should not be applied over very large, raw or abraded surfaces.

Under the Skin.—Hypodermic Method.—Medicines are frequently given by the hypodermic syringe, under the skin. Medicines so used must be non-irritating and in small doses. Pinch up a fold of the skin, thrust the needle through it and empty the syringe. The neck or shoulder is the best to inject as the skin is loose in these regions.

By the Rectum. — When medicines cannot be given or retained by mouth, they may be given by way of the rectum. When we want a local action in the last gut, to destroy the small worms infesting the large bowels, to stimulate the action of the

intestines and evacuate the bowels, and to nourish the body, we resort to enemas or injections, or to suppositories.

Injections, when given merely for absorption, should be small in quantity, neutral or slightly acid in reaction, and at a temperature of the blood. These, like foods by rectum. should only be injected after the last bowel has been cleared, either by hand or by copious enemas of tepid water. When given to assist a physic given by mouth, it should be large enough to distend the bowel and cause horse to eject them. Simple water, salt and water, or soap and water, in quantities of a gallon or more, should be given every half hour. They should be retained for a time to moisten the dung and favor passage. Stimulating injections (Turpentine, 1 to 2 ounces, in Linseed Oil, 16 ounces) should be used after those already mentioned have emptied the last bowel, to still further increase the worm-like movement of the intestines, and rid the purging medicine.

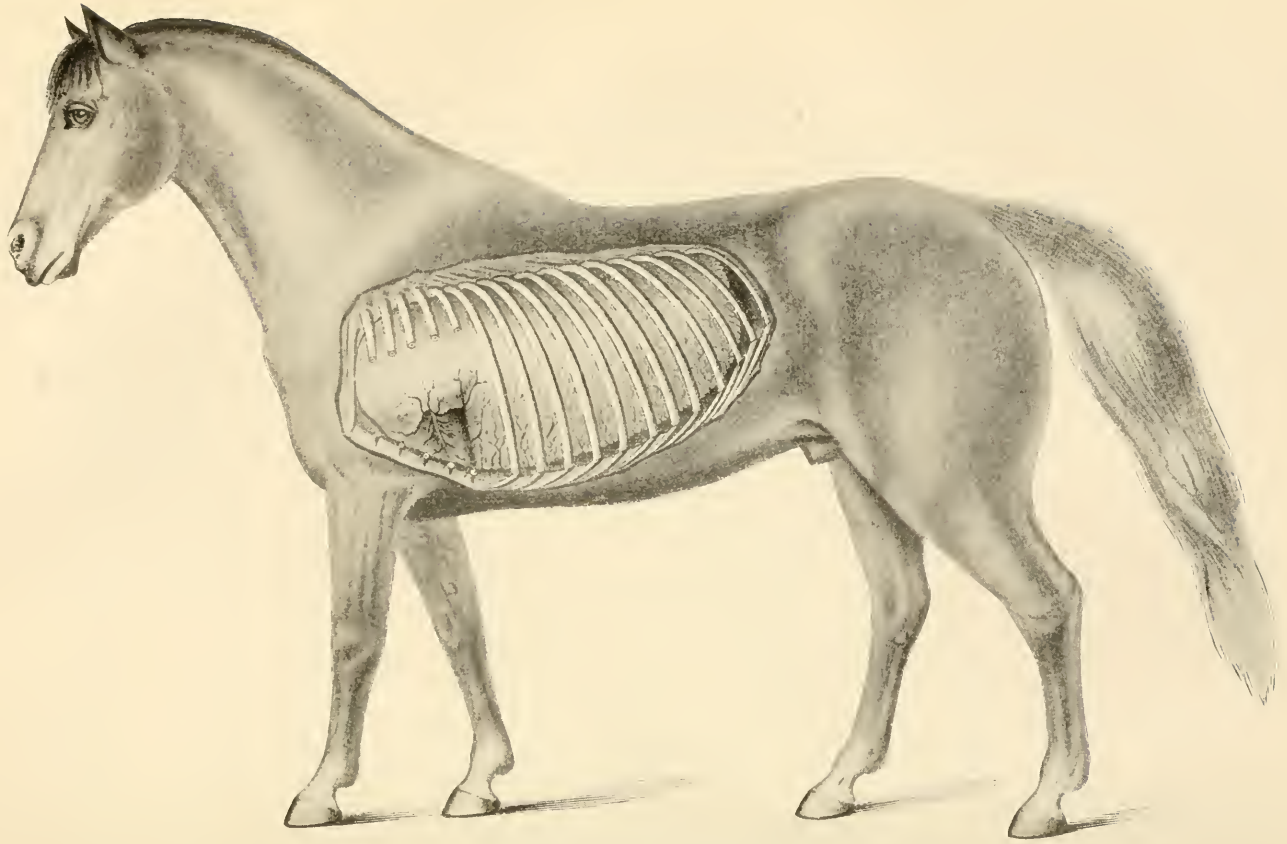
To give an injection take four to six feet of one-half inch garden hose; in one end place a funnel, oil the other end and insert it into the rectum, gently press it in as far as it will go easily, elevate the funnel and pour the injection into it. After some of the injection has passed into the rectum the hose can generally be pushed in still further. After the injection has all passed in gently withdraw the hose. This is a much better way of giving an injection than with a pump.

HOW OFTEN TO GIVE MEDICINES.— Medicines given to reduce fever, such as Aconite, Spirits of Niter, solution Nitrate or Chlorate of Potash, or any form of Ammonia, should be repeated as often as every two hours in bad cases, and from that to three to four times a day in mild cases. Alteratives may be repeated once or twice a day. Purgatives may be repeated after twenty to thirty hours in bad cases, and after forty to forty-eight hours in mild cases. Tonics may be repeated once, twice or thrice a day. Stimulants, especially alcoholic, may be repeated after two to six hours. Doses that cause contraction of the womb may be repeated after an half hour. Anodynes may be repeated after an half hour, and other remedies as required in the case.

SOME POINTS IN DETERMINING THE NATURE OF A DISEASE.—If the horse is standing with head hanging down, eating very little, breathing heavily, and coughing, there is evidently some trouble with organs of respiration. Should the animal be in severe pain, getting up and down, rolling about the stall, and slightly bloated, it is safe to conclude that there is some trouble with the stomach or bowels. Again, should it be that the horse has a straddling gait, attempts to make water often, passes out and draws in the penis, and sometimes stamps with the hind legs, there is evidently some trouble with the kidneys or bladder. If you do not see the horse when first taken, find out if possible how long he has been ailing; how he has been acting; and what he has done that might act as a cause. This will help you to give an idea as to what set of organs to examine first. In all cases try the pulse, and take the temperature. The oftener the pulse beats above the normal and the higher the temperature rises the more serious the case is likely to be. When you have found out the organs affected, the symptoms of diseases in that department will probably enable you to determine the nature of the complaint so that you may successfully use the treatment therein given.

THE PULSE.—The pulse is very important in diagnosing disease and especially in determining the seriousness of disease. The pulse indicates the action of the heart. It is generally taken on the underside of the lower jaw just in front of the angle; by running the fingers along this region, a small cord-like structure will be felt, press this gently and the beating will be recognized. Aside from counting the beats per minute, also notice the softness or hardness of the pulse, that is, does the artery feel fairly soft, or hard like a wire; the regularity is also noticed. The healthy pulse of the horse is fairly soft, full, regular, and beats from 36 to 40 times a minute. In order to become proficient in recognizing an unhealthy condition of the pulse, take the pulse of healthy animals a large number of times.

THE TEMPERATURE.—The temperature is another very important condition in diagnosing disease. It often has to



POSITION OF THE LEFT LUNG.

be used to distinguish between different disorders; without taking the temperature, we can form but little idea as to the location or seriousness of the trouble. By temperature is meant the temperature of the internal organs, regardless of the external surroundings, and during health will vary but little. It is taken by means of a clinical thermometer; this thermometer is so arranged that the column of mercury remains at the same point when changed to a colder place, and so the reading does not change when taken from the animal. The thermometers are graduated to one-fifth degrees. In the lower animals it is best to take the temperature at the rectum. First, shake the thermometer until it reads below 100 degrees, then insert it into the rectum and press it to one side so the bulb will lie against the rectal wall. Leave the thermometer in the rectum two minutes. The normal temperature of the horse is 100 degrees, and during health will rarely vary more than 1 to 1½ degrees. Violent exercise may cause it to rise a little; it is also higher after a full meal. A rise of temperature is spoken of as fever. A rise of 5 or 6 degrees is serious, and a rise of 7 or 8 degrees will result in death, unless lowered in a short time. In some diseases the temperature is below normal.

DISEASES OF THE RESPIRATORY OR BREATHING ORGANS

CATARRH, OR COLD IN THE HEAD.—Catarrh means a congestion or inflammation with a discharge from any mucous membrane. This form is an inflammation of the mucous membrane of the nasal cavities, and often extends into the passages of the head, involving the eyes as well, the lining membrane of which is but a continuation of that of the nose, the flow of tears down the cheek being caused by the closing of the tear duct into the nose by inflammation.

Causes.—Exposure to storms, cold winds, standing in drafts while warm after driving, inhaling smoke or gases, etc.

Symptoms.—At first the membrane is dry, congested and irritable, the color being much deeper than normal; following this there is a watery discharge from the nose, and often also from the eyes, the tears flowing down the cheeks; more or less fever; animal may be dull; more or less sneezing, but does not cough unless the throat is affected; expels the air forcibly through his nostrils as though "blowing his nose." In a few days the discharge from the nose becomes a thick, yellowish-white, and is more or less profuse. Sometimes the appetite is lost and animal becomes debilitated.

TREATMENT.—

Give good care and attention lest it run into something serious. A few days rest, with pure air and good food, will accomplish more than medication while horse is excited and exposed to draughts and changes of temperature. Steam the animal's head over a bucket of boiling water, stirring water with a wisp of hay to make steam rise better; or a more efficient way to steam the head is to take a canvas bag large enough to slip over the horse's nose and from two to three feet long; slip the nose into this bag and hold it in place by a strap over the head, opposite the nostrils cut two holes an inch and one-half in diameter. For generating steam use a tea-kettle; into the spout of the tea-kettle fit a cork through which is passed a piece of glass tubing; to the glass tube fit a piece of rubber tubing from three to six feet long; place the other end of the tubing in a small hole in the bottom of the nose bag, and the steam as it is generated will pass into the bag through the tubing. Generate the steam by placing the kettle on a small gasoline or oil burner. Regulate the flow of steam by the blaze or by lifting the cover of the kettle. While pure steam is good, medicated steam is better. To medicate, put into the water, after it begins to boil, Camphor Gum, a piece as large as a hickory nut, 2 teaspoonfuls Fluid Extract Belladonna, or a half teaspoonful of Carbolic Acid; any one or all three may be used. Use a little care at first not to frighten the horse; also be careful and not burn the nose. Repeat three

times a day for one hour or more each time. Give bran mashes, scalded oats, linseed gruel and grass, if in season. If constipated, give injections of warm water into the rectum three or four times a day, and a pint of Raw Linseed Oil once a day, but do not give purgatives.

If there is fever, give the following:

Fluid Extract Belladonna	2 ouuces.
Fluid Extract Aconite	2 drachms.
Saltpeter	2 ounces.
Alcohol	6 "
Water to make	1 pint.

Dose: 1 ounce three to five times a day.

If the discharge continues after a week or two, give night and morning a tablespoon, level full, of a mixture composed of equal parts of Sulphate of Iron and Saltpeter. Give in moistened grain.

If the animal is unthrifty, give at noon the tonic recommended for "Chronic Indigestion."

NASAL GLEET, OR CHRONIC CATARRH.—This is chronic inflammation of some part of the membrane affected in common cold.

Causes.—Neglected or obstinate catarrh, that will not yield to treatment, are the usual causes, though it may arise from fractures, and from diseased bones or teeth.

Symptoms.—The long continued discharge, which varies in quantity, according to circumstances attendant—the cause of the trouble and part affected—indicates the disease. Horses have sometimes been condemned as glandered, who have had nasal gleet only. It is not contagious, nor dangerous, but sometimes difficult to cure. The glands under and between the lower jaw may be enlarged. The ragged-edged ulcers of glanders are not found on the lining membrane in the nostril. When in doubt, study symptoms of glanders. The eye on affected side may have a peculiar look, and be smaller than the other; there may be enlargement or bulging of the face bones over the part affected, between or below the eyes; breath may be offensive, indicating decay of bone or diseased teeth. If last, will hold head

to one side when eating, or drop food when partly chewed. By tapping on bones between or below the eyes, above back teeth of upper jaw, a hollow sound is emitted if healthy, but if sinus is filled with pus, or contains a large tumor, it will give a solid sound. Hair may be rough over part affected, or bone soft to touch. The horse may be unthrifty.

TREATMENT.—

First, if possible, find cause of trouble. Give good food and regular exercise. Food box had best be put on the ground, as this favors discharge from the head. Cases that do not require surgical treatment must have persistent medical. Give the Iron and Saltpeter mixture, and the digestive tonic as recommended in "Cold in the Head," except that they be given alternately. If animal will not eat on food, give as a drench in a pint of water. Also give twice a day for two days two ounces of a solution of:

Iodide of Potash	1 ounce.
Water	1 pint.

Discontinue for four days and give again, repeating in this manner every two weeks. Steam the head as in simple catarrh, steaming at evening if the animal works. Keep the nostrils washed for appearance sake; a douche composed of:

Boracic Acid	1 ounce.
Water	1 quart.

May be of great value; for giving a douche see under "Medicines," fore part of book. If nasal gleet is caused by a diseased tooth, it must be removed. The operation of trephining, in expert hands, is the best in such a case, as it opens up the cavity, which can be attended direct. In all cases where the sinuses contain either collections of pus or tumors, the only relief is to trephine. Either of these operations will require the services of a veterinarian.

WOUNDS ABOUT THE NOSTRIL. — Wounds in this neighborhood are common, and are generally caused by getting "snagged" on a nail or splinter, or by the bite of another horse; or by getting run into; or by running against something. Occasionally the nostril is so badly torn and lacerated that it is impossible to effect a cure without leaving the animal blemished

for life, but in the majority of cases, the blemish or scar is due to the want of proper treatment on the part of the owner or attendant.

TREATMENT.—

As soon as possible after the accident the parts should be brought together and held there by stitches. If too much time is allowed, the swelling of the parts will considerably interfere. The skin in this part is thin and delicate, and therefore it is easy to insert sutures. Never cut away any skin that may be loose or hanging, or a scar will certainly remain. Bring the parts in direct apposition and place the stitches from a quarter to an half inch apart, as circumstance may demand. It is not necessary to have special surgeons' silk or needles for this operation; good linen thread or ordinary silk thread will answer, but the work must be nicely done. The wound afterward requires only to be kept clean. For this purpose it should be cleansed and discharges washed away daily with a solution made of:

Carbolic Acid	1 part.
Water	30 parts.

Mix.

If the horse is inclined to rub the wound against some object on account of the irritability, his head should be tied by means of two halter ropes, to prevent him rubbing the wound open. The head should be so tied about ten days, except when at work or eating.

If swelling becomes extensive, foment and use astringent wash, as White Lotion (page 263).

NASAL POLYPUS, OR SMALL TUMOR OF THE NOSTRIL.—These are pear-shaped excrescences, growing in the nasal passages, and are an obstruction to the breathing on the side where located. They vary much in size; some so small that their presence is not manifested, while in other cases, the size may cause serious obstruction to the passage of air. In some cases they hang toward the nasal opening, and sometimes toward the pharynx.

Symptoms.—There is a discharge from the nostril, and a more or less snuffling sound in breathing, or difficult breathing, according to size; a discharge of blood, if injured, and sneezing.

TREATMENT.—

The only relief is the removal of the polypus, by grasping it at the base with suitable forceps, and twisting it round and round until torn from its attachment, or by removing it with the ecraseur. The resulting hemorrhage is checked by an astringent lotion, as a solution of Tincture of Iron, or Alum, 1 to 2 ounces to a pint of water. The operation should generally be done by an expert.

SORE THROAT; LARYNGITIS.—The larynx is situated in the space between the lower jaw bones, just back of the root of the tongue, and is retained in this position by the windpipe, muscles, and bones to which it is attached. The opening leading into it from the pharynx is elliptical, its border is quite thick, and is covered with thick, mucous membrane. The lining membrane is so sensitive that a particle of food dropped into it from the pharynx, causes violent coughing.

Causes.—Are the same as for catarrh.

Symptoms.—First symptom usually is a cough, followed by difficulty in swallowing; so much so, that in many cases the water drank will be returned through the nose; mouth is hot, and saliva dribbles from it; glands of lower jaw may be swollen; pressure on larnyx causes a characteristic cough; head is "poked out;" membrane of the nose becomes red, and a discharge from nostrils soon appears. As disease advances a rasping snore is heard, breathing is hurried, and sometimes animal seems in danger of suffocation. The pain of swallowing is so great that the animal refuses feed to a great extent. Temperature rises two to six degrees. Pulse is accelerated—sixty to ninety per minute.

TREATMENT.—

In all cases steam the nostrils as advised in Cold in the Head using medicated steam. In bad cases, steam continuously until relieved. Put animal in a dry, warm, but well-ventilated stall, bandage legs, and blanket body, Feed bran mashes, scalded oats,

linseed gruel, and if in season, freshly cut grass. Have temporary feed box at about height he carries his head, so he can eat without unnecessary distress. Keep fresh water where he can get it all the time. If constipated, give him injections of warm water in the rectum three or four times in twenty-four hours. Rub well in on his throat, from ear to ear, a liniment composed of:

Soap Liniment	4 ounces.
Aqua Ammonia	2 "
Turpentine	2 "

Well shaken together. Use once or twice a day.

Flannel cloths wrung from hot water and bound on the throat are also of great value. Change every fifteen minutes so as to keep continuously hot. Give the following electuary:

Fluid Extract of Belladonna	1½ ounces.
Camphor	3 "
Chloride of Ammonia	3 "
Saltpeter	3 "
Molasses and Flour, or better, Pulverized Licorice Root, to make	1 pint of paste.

Dose: $\frac{1}{16}$ of the mixture smeared on the back of the tongue with a paddle three to five times a day.

Also throw into the back part of the mouth, with a syringe, from three to six times a day, one ounce of the following:

Chlorate of Potash	1½ ounces.
Tincture of Iron	4 "
Water to make	1 pint.

Never attempt to drench a horse having a sore throat.

In urgent cases, where suffocation seems inevitable, tracheotomy (see OPERATIONS) must be performed. During the time tube is used, other treatment should be continued.

If abscesses form, use hot, soft Linseed Meal poultices, or the hot flannel cloths, for hours, to encourage formation of pus; after they break, treat as any abscess (see OPERATIONS). If the glands remain swollen after attack rub over every day with an ointment composed of the following:

Iodine	2 drachms.
Iodide of Potash	1½ "
Biniodide of Mercury	20 grains.
Lard	1 ounce.

Well mixed. Rub in well with a rub-cloth.

If the part gets sore, withhold for a few days and then apply again. Should chronic cough remain, treat as described under that heading.

CHRONIC COUGH.—This may succeed the acute diseases of the respiratory organs, or accompany other diseases. It sometimes exists as an independent affection, the animal being otherwise in good condition.

When cause is known, treat as given in the disease. If it exists without any apparent connection, give every night, in a bran mash, one of powders as given:

Sulphate of Copper	1 ounce.
Digitalis	1 "
Pulverized Squills	1 "
Niter	1 "
Camphor	1 "

Mix and make into 10 powders.

Or: 2.

Gum Camphor	1½ ounces.
Digitalis	1 ounce.
Linseed Meal	2 ounces.

Powder and mix, and make into 12 powders, and give one night and morning in soft food.

Or: 3.

Camphor	1 drachm.
Digitalis	½ "
Calomel	1 "
Opium	1 "

Mix into a ball with syrup and give as one dose; give every day for a week, then skip a week and repeat.

Or: 4.

Fluid Extract Belladonna	2 ounces.
Chloride of Ammonia	3 "
Saltpeter	3 "
Water to make	1 quart.

Dose: 2 ounces three times a day.

Or: 5.

Iodide of Potash	1 ounce.
Water	1 pint.

Dose: 1 ounce morning and night. Give for a week, discontinue a week and give again.

Stimulating liniments or mild blisters may be used in connection with any of the above as applications to the throat.

ROARING AND WHISTLING.—The terms "roaring" and "whistling" are names for variations of the same trouble. Whistling may accompany a sore throat, passing with the disease that caused it.

Causes.—The immediate cause is an obstruction to the free passage of air in some part of the respiratory tract. This may come from the laryngitis, thickening of the membrane, nasal polypi, deformed bones, paralysis of the wing of the nostril, but paralysis of the muscles of the vocal cord cause by far the most. The muscles of the left in last cause are almost invariably the ones affected.

Symptoms.—In chronic roaring, the noise is made when the air is drawn into the lungs; and only when the disease is advanced is a sound produced when air is expelled, and not nearly so loud as the inspiration. The best way to bring out the characteristic symptoms of roaring, is to make horse pull a load up a hill, or if he be a saddle or carriage horse, gallop, or drive fast up a hill. In difficult cases, the animal becomes entirely exhausted, breathes rapidly and with difficulty, with nostrils distended, and animal appearing as if suffocation was imminent. The roaring sound produced by inspiration can be heard some distance.

TREATMENT.—

When confirmed, nothing can be done. In recent cases give:

Iodide of Potash	2 ounces.
Fluid Extract of Nux Vomica	2 "
Nitrate of Potash	2 "
Water to make	1 pint.

Dose: 1 ounce in feed night and morning; give for a week, discontinue for a week, give again.

Apply the following blister to the throat:

Spanish Fly	1 drachm.
Biniodide of Mercury	1 "
Lard	2 ounces.

See "How to Apply a Blister," under "Ring Bone." In the case of a valuable horse, a qualified veterinarian can perform an operation on the larynx, which will generally relieve the animal,

Partial relief can also be produced by fastening a strap from one bit ring over the nose to the other bit ring; fasten to the under side of this strap on each side, a small pad, in the form of a piece of leather, in such a way that it will press against the wall of the nose just above the nostril. This will cut down the size of the nasal cavity, and prevent as much air from entering, and thus relieve the animal and also prevent, to a great extent, the roaring sound.

BLEEDING FROM THE NOSE.—This often occurs during the course of other diseases, viz: influenza, bronchitis, purpura hemorrhagica, glanders, etc. It also occurs independent of other affections, and as has been noted, is a symptom of polypus of the nose. Injuries to the head, exertion and sneezing will also induce it. The bleeding is generally from one nostril only, and not serious; the blood comes in drops (rarely faster) and is never frothy as when from the lungs.

TREATMENT.—

Bathe the head and wash out the nostrils with cold water; this is generally sufficient. If it continues, pour ice-cold water over the face, between the eyes and down over the nasal chambers. A bag of broken ice is good. If these means fail, give a douche of Alum water:

Alum	1 ounce.
Water	1 pint.

Or use Sulphate of Iron in place of the Alum. For giving douche, see under "Medicines," fore part of book.

BLEEDING FROM THE LUNGS.—This may occur during the course of congestion of the lungs, bronchitis, pneumonia, influenza, purpura hemorrhagica, or glanders. An accident or exertion may cause it. Plethora predisposes to it. Following the rupture of a vessel, the blood may escape into the lung tissue and cause pneumonia, or it may fill up the bronchial tubes and suffocate the horse.

Symptoms.—When from the lungs, there is coughing; the blood is frothy, and comes from both nostrils. The ear placed to the windpipe, along its course, will hear a gurgling and rattling sound.

TREATMENT.—

When in connection with another disease it seldom requires special treatment. When caused by accident or exertion, the animal should be kept quiet. If cough is frequent or paroxysmal, give:

Tincture of Opium	2 ounces.
Raw Linseed Oil	8 "

This to allay irritability, which may stop hemorrhage by checking cough. If bleeding is continuous and profuse, give 1 ounce Fluid Extract of Ergot; repeat in from one-half to one hour.

Or:

Acetate of Lead	1 drachm.
Water	1 pint.

May be given as a drench. Or,

Tincture Perchloride of Iron	1 ounce.
Water	1 pint.

May be given instead. Dashing small amounts of cold water against the chest may benefit. A hemorrhage into the lung may occur without any outward bleeding and cause death.

BRONCHITIS.—Bronchitis is an inflammation of the bronchial tubes—the two branches of the trachea, or windpipe, leading to the lungs. The mucous membrane alone may be affected, or the whole tube may be involved.

Causes.—The same as produce catarrh, sore throat etc.; the inhalation of irritating gases and smoke; and by fluids, as medicines, and solids, gaining access to the parts.

Symptoms.—Generally ushered in by a shivering fit—chill; dull; no appetite; breathing very much quickened; a painful cough, at first dry, then moist and rattling; mouth hot; pulse at first full and quick, but later smaller and more frequent; the temperature is elevated,—104 to 107 degrees. If ear is placed to sides of chest, a hissing or wheezing sound is heard if smaller tubes are affected, and a hoarser, or tubular sound, when larger tubes are involved. A heavy, tubular sound will also be heard by placing the ear in front of the chest at the base of the neck. After a day or two the dry stage is succeeded by the moist, and

the ear detects a different sound, caused by the air passing through the mucus which has collected in the tubes, as a result of the inflammation. The sound is much like that caused by air passing through water—a bubbling sound. There is a discharge of mucus from the nose; breathing labored, shorter, quicker, as disease advances; horse will not lie down; bowels constipated and the droppings covered with slimy mucus; urine decreased and dark; more or less thirst, but less and less desire for food; in some cases mouth full of saliva. If disease takes a favorable turn, the symptoms become less marked, pulse gets stronger and less frequent, temperature gets lower, cough less painful and breathing easier.

In order to recognize the abnormal sounds produced with lung disorders, one should place the ear to the chest of healthy animals, to become familiar with the healthy sounds.

TREATMENT.—

First, treat the chill; put warm blankets on the horse; rub the legs, and give internally.

Alcohol.....1½ ounces.
Water..... ½ pint.

Any other stimulant may be used in case the alcohol is not at hand. Also give the following:

Fluid Extract of Aconite..... 10 to 15 drops.
Fluid Extract of Belladonna..... 1 teaspoonful.

Repeat the stimulant in from one-half to one hour, and again in an hour and a half to two hours. Repeat the Aconite and Belladonna in about two hours. Hot water bottles placed under the blankets will help. Overcome the chill as quickly as possible. After the chill subsides, commence giving mixture recommended a little further on.

Have good quarters and plenty of fresh air without drafts. Blanket when season demands; rub legs until warm, and bandage from hoof to knee and hock. If hand rubbing does not suffice, use liniment as in "Sore Throat." Apply liniment well over side of chest, behind elbow and shoulder blade, covering space immediately behind elbow and shoulder blade, and running back eighteen inches, and from elbow below, to within five or six inches of

the back bone. Mustard, mixed into a paste with lukewarm water may be used in place of the liniment. Hot water bottles hung against the chest, under the blanket, are of great value. Change the water quite frequently. Steam, as in "Cold in the Head," and in serious cases repeat every hour.

After quenching the thirst by giving small amounts of water frequently, keep a pail of fresh water before the horse continually, adding 2 ounces Epsom Salts to each pailful. Feed a little scalded bran and oats, roots or potatoes, and grass, or if not in season, a little clover hay. Offer only a little at a time and remove if animal does not wish it.

Internally for the first two days use the following:

Fluid Extract of Aconite	1½	drachms.
Fluid Extract Belladonna	1	ounce.
Ammonia Chloride	2	ounces.
Saltpeter	1½	"
Alcohol	5	"
Water to make	1	pint.

Dose: 2 ounces from four to six times a day.

After two days use the following:

Fluid Extract Digitalis	3	drachms.
Fluid Extract Belladonna	½	ounce.
Ammonia Chloride	1½	ounces.
Saltpeter	1½	"
Alcohol	4	"
Water to make	1	pint.

Dose: 2 ounces from four to six times a day (24 hours).

If the fever is high and foregoing does not lower it, give 1 drachm of Acetanilid in 1½ ounces of Alcohol, twice or three times a day, if the case requires; ½ drachm doses of Quinine three times a day is also good.

If it is hard for the animal to elevate the head to be drenched, throw the medicine, a small amount at a time, into the back part of the mouth with a hard rubber syringe, or give in the form of a paste as in "Sore Throat."

Give the animal a good brushing each day, throwing back only one-half of the blanket at a time for the purpose.

As the animal commences to improve give a tonic in the form of a teaspoonful of Fluid Extract of Nux Vomica and 2

teaspoonfuls of Fluid Extract of Gentian in a little water three times a day; after a few days substitute for this tonic the ones recommended in "Chronic Indigestion."

Let the animal thoroughly recover before giving exercise and start in very gradually.

If cough persists give Iodide of Potash as in treatment for "Chronic Cough."

If during the course of the disease the heart becomes very weak give 2 grains of Strychnine three times a day in addition to the other medicines.

CHRONIC BRONCHITIS.—

Causes.—May follow acute bronchitis, or be due to same causes. In most cases it is attended with thickening of the walls of the tubes.

Symptoms.—Its course is slower and is not attended with as much fever as in acute form. Animal's breathing becomes quickened and he shows signs of exhaustion if exerted. May keep up fairly well in strength and appearance, but may gradually run down. Cough may be husky, smothered or muffled, or be hard and clear; whitish discharge from nose. The ear at the side of the chest hears rattling of air through the mucus; or a tubular sound.

TREATMENT.—

Generally the horse is kept at work, as owner says "he has a deep cold." This is wrong, for rest must be had if a cure is desired. Exertion may bring on an acute attack. Give same care and treatment as in acute form, giving the medicine, however, less frequently; give the tonics, and treat the cough as recommended for "Chronic Cough."

CONGESTION OF THE LUNGS.—An abnormal accumulation of blood in the lungs. Inflammation of the lungs is always preceded by congestion, or to make it plainer, congestion may be considered as the first stage of inflammation, but in this connection we will consider it as an independent disorder.

Causes.—When it exists as an independent affection, it is generally caused by over exertion when animal is not in fit condition to undergo more than moderate exercise; over-fat animals, or very old hard worked animals. More apt to occur in hot weather.

Symptoms.—Horse suddenly stops all out of breath; nostrils distended; flanks heaving; countenance has an anxious look; head down, ears forward, legs braced, elbows turned out; he looks around as if in search of more air; may paw the ground in effort to breathe, and acts as though suffocation were near. Pulse 100 or more; heart beating tumultuously at times, and then again may be scarcely perceptible. If ear is placed against side of chest, a loud murmur is heard, and perhaps a crackling sound. There may be a frothy discharge from the nostrils, sometimes tinged with blood; if much blood the condition is serious.

TREATMENT.—

If on road, let him stop; do not attempt to return to stable; blanket, turn his head to the wind and loosen harness where it may interfere with breathing. By no means have horse walked, as is sometimes done. Rub vigorously with cloths, hay or straw, to stimulate circulation; get legs warm if possible and use liniment as recommended in "Bronchitis" on cold part of legs. When circulation is better, bandage from hoofs as far as possible. Blanket, and have rubbing done under blanket. Give Spirits of Nitrous Ether and Alcohol, of each 2 ounces, in 1 pint of water as a drench; repeat in an hour and then every two hours until relieved. Also give 10 to 15 drops Fluid Extract of Aconite and 1 teaspoonful Fluid Extract of Belladonna; repeat every two hours. If it takes too long to get this, give ¼ pint of Whiskey in 1 pint of water, or the same amount of Brandy as often; or 1 ounce Tincture of Arnica in a pint of water every hour until five or six doses have been given. If none of these are at hand give 2 tablespoonfuls of Turpentine shaken in ½ pint of milk. This will be good until something else can be had. A tablespoonful of Aqua Ammonia in a pint of water is also good. Active measures may cease with alarming symptoms, but good care must be given for several days, for this may be followed by pneumonia.

Keep in comfortable stall, have legs and body well covered, give pure air without drafts, plenty of fresh water and bran mashes, scalded oats and grass, if in season, and use tonics as recommended in "Bronchitis." After animal has thoroughly recovered, work in gradually.

INFLAMMATION OF THE LUNGS—PNEUMONIA.—This is an inflammation of the lung tissues; it may attack both lungs, but usually but one, perhaps most often it is the right one that is affected. It may be complicated with bronchitis, pleurisy, or both.

Causes.—It may be directly due to any of the causes for diseases of the air passages, as those causing bronchitis, but in many instances it is due to either wilful neglect or ignorance. A common cold may run into pneumonia if neglected or improperly attended. Allowing an animal which is over heated to cool too quickly, especially if in a draft, over exertion, bad quarters, and many other things may tend, directly or indirectly, to bring on an attack.

Symptoms.—The first stage is a shivering fit, more or less prolonged, breathing is accelerated; horse hangs his head and has a dull look; mouth is hot and sticky to touch; fever 103 or higher; pulse very frequent, 70 to 80 or even 100 a minute, but varying much in character; may be hard or feeble, large or small, intermitting, etc. There is usually a dry cough from first, but changing as disease advances; sometimes nasal discharge is tinged with blood, and at other times seems like matter; little or no appetite; desire for water is increasing; legs cold; bowels more or less costive; dung usually covered with mucus: urine scanty and dark in color. Will not lie down; if complicated with pleurisy will lie down, but rises soon. In pneumonia, breathing is rapid and difficult, but when pleurisy is present, the ribs are kept as still as possible and the breathing abdominal. There is no pain unless pleurisy is present. A healthy lung if tapped on, produces a resonant sound, but when inflamed a dull one. If pleurisy is present, animal will flinch, as blow causes pain. Placing ear to chest, a respiratory murmur is heard if horse is healthy. In first stage of pneumonia, the murmur is loud and hoarse, with a fine

crackling sound; when lung is solid, no sound is heard. The symptoms resemble very closely those of bronchitis, except in listening at the chest, we notice the crackling sound instead of the tubular; the cough is not as painful as in bronchitis.

TREATMENT.—

The general outline of treatment is as in "Bronchitis." Best of quarters, and plenty of pure air. It is better to blanket warmly than to warm by stopping ventilation. Give water and feed and same general care as in "Bronchitis." Treat chill as in "Bronchitis." Rub legs until warm and then bandage from hoofs up; if hand rubbing is not sufficient, use liniment as in "Bronchitis," and repeat once or twice a day the rubbing and liniment. Apply to the chest the same applications as in "Bronchitis;" the hot applications are especially valuable. If constipation exists, give laxative food, such as scalded oats, bran, and linseed mashes, and to these add grass or clover hay if not the season for grass. If no desire is evinced for food of above kinds, allow anything that the horse will eat. Also give injections per rectum. Hay tea may be given as much as animal will drink, and this may create a desire for other food; a little corn on the cob, apples, carrots, or sweet milk with three or four eggs to the gallon, if he will drink it, three or four gallons may be given a day. Internally give the same treatment as for "Bronchitis," taking the same care in drenching. During convalescence use the same tonics as in "Bronchitis." The treatments for the two diseases are so similar it makes but little difference whether we differentiate between them or not.

PLEURISY.—This is an inflammation of the pleura or serous membrane lining the chest cavity, and also investing the lungs. Of itself it is not necessarily fatal, but inflammation of serous membranes is inclined to abundant effusions of serum—a watery fluid. This condition, called "hydrothorax," is serious.

Causes.—May be due to any of the causes that lead up to other diseases of the breathing organs; by wounds that puncture the chest; or fractured ribs; and may accompany other diseases of the breathing organs.

Symptoms.—We get the chill followed by a high fever; at first the animal is apt to show more or less pain by uneasiness and looking around at the chest, acts a little as with mild colic. The breathing is hurried, temperature elevated, 104 to 107; pulse accelerated, 60 to 90, or even higher, rather hard and small; elbows turned out; the chest is held rigid, breathing is carried on by the abdominal muscles, causing a line to extend along the lower border of ribs up to hip bone—the pleuritic line; flanks tucked up, animal dislikes to turn around. If the chest is tapped with the knuckles the horse shows pain, more noticeable if the fingers are pushed in between the ribs. If the chest is slapped with the hand the animal is apt to grunt or groan.

In the early stages, by placing the ear to the chest a grating or frictional sound is heard, caused by the dry pleura covering the lungs rubbing against that lining the chest; later on the effusion is thrown out and this sound ceases. If the effusion is profuse, the serum begins to collect in the bottom of the chest and float the lungs up toward the top; as this progresses we notice there is no sound below the "water line," and an increased murmur above. If the chest does not fill more than one-third full, and the inflammation subsides, the effusion may be reabsorbed and recovery take place; if it fills more than one-third, the serum will need to be drawn off mechanically.

TREATMENT.—

This varies but little from that in "Bronchitis" and "Pneumonia." Adhere to the general management as in "Bronchitis" and "Pneumonia," and give the same medicines internally; the disease needs rather vigorous treatment, so repeat medicines full number of times. If the heart is at all weak use the Strychnine. The external applications to the chest are very important—use the hot water bottles. If the chest fills more than one-third full it should be tapped with a trocar and canula and the fluid drawn off; this would require a veterinarian. Sometimes the lung affected will grow fast to the chest wall. During convalescence give the tonics.

WATER IN THE CHEST—HYDROTHORAX.—This is the filling of the chest with water following pleurisy.

Causes.—At first after active inflammation, the effusion relieves pain and the horse brightens up, begins to eat and is more comfortable until water floats the lungs and interferes with breathing. The countenance becomes anxious and haggard; animal is dull and weak, and shows little appetite for food; breathing more difficult and rapid, and pulse high. Tapping the sides of chest will produce sound like the solid sound on a barrel of water, and the ear detects no respiratory murmur in the lower part of the chest.

TREATMENT.—

Rub liniment, as in "Bronchitis" and "Pneumonia," over lower part of both sides and bottom of chest. Continue the treatment as given in "Pleurisy," and use the tonics. Also give 1 drachm Iodide Potassium in a pint of drinking water one hour before feeding every night and morning for a week or two.

Hydrothorax is sometimes difficult to overcome by medicine and tapping is then resorted to (see OPERATIONS).

BROKEN WIND, OR HEAVES.—Much confusion exists as to the nature of this trouble, and though veterinarians are well acquainted with the phenomena and locality of the disease, there is some diversity of opinion as to the exact cause. An after-death examination in recent cases—those that have had the disease but a short time—shows no marked changes, but old cases show well-marked lesions, walls of bronchial tubes thickened, right side of heart enlarged and cavities dilated; stomach enlarged, and in many cases, intestinal walls changed. The lungs are changed in two ways—by dilation and rupture of walls of the cells, and by air finding its way into the tissue between the cells.

Symptoms.—The peculiar double motion of the flanks in expelling the air, points to the ailment at once. The nostrils are inflated, and the accompanying cough is short and something like a grunt. When excited, a wheezing noise accompanies breathing. This may be heard to a less extent when at rest by placing the ear to the chest. The animal is much worse during close, "muggy" weather. Animal has a depraved appetite and will eat

soiled bedding rather than good food, and the abdomen may become what is called "pot-bellied;" passes wind frequently, which has an offensive odor. If a horse has been "doped" by sharpers so that symptoms are suppressed, he can be tested by giving him as much water as he will drink, and then drive him up a stiff hill or on a heavy road. This will bring out the characteristics of the disease. The cough, which is not at all regular, is usually one of the first symptoms.

TREATMENT.—

When once well seated there is no cure for it, but judicious feeding and remedies will help to allay its severity. In recent cases more may be accomplished. Feed a small quantity of the best hay and more grain, and slightly dampen to allay dust. Water before feeding, not after. Do not work immediately after eating. Carrots, turnips and potatoes chopped and mixed with oats or corn are good. Pasturing gives relief. One of the best remedies is solution of Arsenic in Hydrochloric Acid (Liquor Arsenici Hydrochloricus). Give 1 tablespoonful with bran or ground oats three times daily for two weeks; then twice a day for two weeks longer; then once a day for several weeks, is a good way to give it. Fowler's Solution of Arsenic is also used in the same manner, the dose being the same.

Do not use an animal suffering from heaves for breeding purposes.

SPASMS OF THE DIAPHRAGM—THUMPS OR HICCOUGHS.—This is like hiccoughs in man. Is generally thought to be palpitation of the heart, and while that trouble is sometimes called "thumps" it must not be confounded with this disease, which is a spasmodic contraction of the diaphragm.

Causes.—Same as congestion of the lungs.

Symptoms.—The jerky motion affects the whole body and is not confined to the region of the heart. If one places the hand on the body at about the middle of the last rib while the other is placed over heart behind the left elbow, it will be seen that there is no connection between the jerking of one and the beating of the other. The ear placed to the side will discover that the sound is

back of the heart. In fact the heart is usually weaker and less perceptible than natural. If not relieved, death usually results from congestion of the lungs.

TREATMENT.—

The treatment should be precisely the same as for "Congestion of the Lungs."

Or, in ordinary cases give the following:

Sweet Spirits of Niter	1 ounce.
Laudanum	1 "
Fluid Extract Digitalis	20 drops.
Water	1 pint.

Mix and give as a drench, every two hours until relieved.

If warm weather, apply a woolen blanket wrung out of hot water to the chest, with a dry one outside it; if cold weather, apply Mustard paste around back part of chest and cover body well. In some cases, after giving a few doses of mixture, if not relieved it would be well to give:

Turpentine	1 ounce.
Raw Linseed Oil	1 pint.

Mix and give as a drench.

After animal is better, feed well, give exercise, and bring gradually to regular work.

WOUNDS PENETRATING THE WALLS OF THE CHEST.—In theory, according to some teachers of physiology, when an opening is made in the wall of the chest, sufficient to allow air to enter, a collapse of the lung should occur. This is not always the case, as horses have been known to be in this condition for several hours without above result occurring. Dr. W. H. Harbaugh tells of a case he attended twelve hours after the accident, and he states, that though he found the breathing considerably altered, no bad effect followed the admission of air into the thoracic cavity. The wound was closed and treated by general methods of treating wounds, and a speedy and perfect recovery followed. If the pleura is not penetrated, no bad result is likely to follow, but if it is, pleurisy is likely to result, and even pneumonia if the wound involves the lung.

The condition called "pneumo-thorax," means air in the chest. This may be due to a wound in the wall of the chest, or

it may be due to a broken rib, the sharp edges of which wound the lung sufficiently to allow air to escape into the space about the lung, which is naturally a vacuum. Air gaining access to the chest cavity may have a peculiar effect. The wound may be so made that when the walls of the chest are dilating, a little air is sucked in, but during contraction, the contained air presses against the torn part, so as to close the wound; a little air gets in at each breath, but none escapes until the lung is compressed in small space, and forced into anterior part of chest. A broken rib may cause same condition, but in this case the air gains access from the lung, and there may not even be an opening in the walls of the chest. In hydro-thorax (water on the chest), the gases caused by decomposition of fluid, are said to have caused the same condition. In such cases the air is generally absorbed, and a spontaneous cure is the result. But when the symptoms are urgent, it is recommended that the air be removed by a trocar and canula, or by an aspirator.

TREATMENT.—

The treatment of wounds of above kind should, for reasons stated, be prompt. Find out by careful examination if any foreign body remain in the wound; if so, it should be removed and the wound thoroughly cleaned with a solution of:

Carbolic Acid ..... 1 part.
Water ..... 30 parts.
Mix.

The wound should then be closed immediately. If an incised wound it should be closed with sutures; if torn or lacerated, a bandage around the chest over the dressing is the best plan. At all events, air must be prevented getting into the chest as soon and effectually as possible. The after treatment should consist in keeping the parts clean with the Carbolic solution and applying fresh dressing as often as needed to keep the wound in a healthy condition. Care should be taken that the discharges from the wound have an outlet in the most dependent part. If the wound causes much pain, it should be allayed by a dose of Tincture of Opium (Laudanum). Pleurisy and other complications must be treated as directed under their headings.

DISEASES OF THE MOUTH, TEETH, SALIVARY GLANDS AND GULLET

SORE MOUTH — STOMATITIS.—This is an inflammation of the mucous membrane lining the mouth.

Causes.—Irritating medicines, foods, or other substances.

Symptoms.—Swelling of the mouth, which is hot and painful to the touch; copious discharge of saliva; mucous membrane is reddened, and in some cases there are ulcers or blisters observed.

TREATMENT.—

Feed soft food, and in many cases this is all that is necessary. If this is not sufficient use a wash of Chlorate of Potash, Borax or Alum, from ½ to 1 ounce of either, to 1 pint of water. Hay, straw or oats should be steamed or boiled, if used. Internally give a laxative, 1 quart of raw Linseed Oil, or ½ pound of Epsom Salts, or 1 ounce of Aloes; also give large teaspoonful of Saltpeter three times a day for a few days in the moistened grain. If ulcers form, touch them with Nitrate of Silver, Tincture of Iodine, or other caustic.

LAMPAS.—This is the name given to the swelling of the mucous membrane covering the bars in the roof of the mouth and projecting in a more or less prominent ridge immediately behind the upper incisor teeth. Not nearly so common as imagined.

Causes.—From any of the causes of sore mouth, or in the case of colts from teething.

Symptoms.—The bars in the roof of the mouth are swollen, red and sensitive to the touch. The bars just back of the front teeth are often on a level or below the grinding surface of the teeth in health, and unless red and sensitive, indicates nothing wrong. More or less slobbering, sometimes difficult eating.

TREATMENT.—

Give the same treatment, both local and internal, as in "Sore Mouth." Burning is both cruel and unnecessary.

IRRITATION FROM SHEDDING MILK TEETH.—A trouble of young horses.

Symptoms.—Horse eats with difficulty, sometimes not at all; slobbers; sweats easily; hair looks rough; is gaunt and thin; bowels costive or affected with diarrhea, and oats come through whole.

TREATMENT.—

Look at teeth, back and front, for shells or caps, and remove if any are found. Give soft food, and as a tonic the treatment recommended for "Chronic Indigestion."

WOLF TEETH.—These are small teeth that come just in front of the upper and sometimes the lower molars. They sometimes wound the cheek, by its being pulled against the wolf teeth by the bit. They do no good, but do not, as is sometimes supposed, cause blindness.

TREATMENT.—

Take a pair of pincers or forceps and pull them. They are usually only attached lightly and come easily. Never break them off by punching them out. In pulling, twist back and forth a little, so as not to break them off.

IRREGULARITIES OF THE TEETH.—From the nature of a horse's food, it is necessary that the grinding or rubbing surface of the tooth should be rough. The upper jaw is somewhat wider than the lower, and from the fact of not being perfectly opposed, a sharp edge is left on inside of lower molars and on outside of upper ones, which may injure the lips and tongue. This can be readily felt by the hand, and when so found, should be rasped down. Sometimes the first or last molar may be abnormally long, owing to the absence of its opposite. Should it be the last, an expert would undoubtedly be needed, but the front one can be rasped down. Teeth opposite absent ones from other jaw are much elongated, and such must be shortened. When horses "quid" their food, or when they show distress in chewing, by holding the head to one side, the teeth should be examined carefully, and all sharp corners and projections removed with a rasp.

TOOTHACHE; DECAYED TEETH. — Toothache is rare, and when found is usually from decayed teeth.

Causes.—Usually from biting hard substances that split and break the teeth, inducing decay.

Symptoms.—Horse will suddenly stop chewing, throw his head to one side and slightly open the mouth. Will act as though something had punctured the mouth. Will hold the head sidewise when eating, and sometimes in drinking. Apt to be an offensive odor from nostril or mouth; sometimes a discharge from nostril.

TREATMENT.—

If, on examination, no foreign substance is found in the mouth, carefully try each tooth by gently tapping with a small hammer with a long handle; the horse will flinch when the sore tooth is touched. A twitch may be put on the upper lip to control, if desired or necessary. When found, the offending tooth should be removed either with the forceps or by punching out. For this operation a veterinarian will be required.

CRIBBING AND WIND-SUCKING. — This is not a disease in itself, but an exceeding bad habit, though it may result from some disease. The manger, post, fence, or other object is caught with the teeth, and horse bears down until neck is altered in position so as to form a temporary vacuum in the pharynx, when air rushes in to fill it.

Causes.—By some is considered as the result of indigestion; by others from pain in the teeth while teething; while still others as a result of idleness. Old horses will sometimes become cribbers if tied beside one that cribs.

TREATMENT.—

Put horse in a box stall and feed him from the floor, giving feed from a pail that is removed as soon as empty; leaving nothing which he can get hold of. Examine teeth to see that there are no defects in them; if so, correct. A strap buckled tight around the throat—tight enough to prevent the action—is another means employed. Putting Red Pepper, Aloes, and other

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such ingredients on edges of manger where horse can crib is also resorted to; covering the edge of the manger with metal may prevent. Another way is to put a muzzle on with bars across the nose that will allow eating, but will prevent grasping the manger in his teeth.

For wind-suckers who do not crib, a strap studded with sharp spikes opposite the lower jaw is the best preventive.

If the animal is unthrifty, indicating indigestion, give the treatment recommended for "Chronic Indigestion." With young horses having a tendency to the trouble, give regular exercise.

FOREIGN SUBSTANCES IN THE MOUTH.—Sometimes a piece of stick becomes lodged in the roof of the mouth, and it may be noticed by animal not feeding, and he will be trying to dislodge same continually with his tongue, by working it around in his mouth. If obstruction is not removed, he will fall off in condition. When observed, examine and remove any such obstruction with the hand or pincers. Barley or wheat beards, when horses get straw for food, may get so lodged in the mouth that the animal cannot dislodge them with his tongue. The horse will not feed well, and will fall off in condition. If the mouth be examined the cause of the trouble will probably be found, and should be removed, washing any irritated spot with Borax and Alum water.

PARALYSIS OF LIPS AND CHEEKS.—Not a common disease, but met with occasionally.

Causes.—An injury to the nerves of motion in the lips and cheeks.

Symptoms.—Animal is not able to use his lips in eating or drinking; they hang flabby and loose, and have the appearance of being swollen, but this is only from the looseness that makes them appear so. When drinking, animal puts his head deep in the water, as this is the only way he can drink. If one side only is affected, lips may be drawn toward the other side.

TREATMENT.—

Keep up strength by giving soft food, and give him rest. Stimulating liniments or blisters may be applied to the cheeks to

stimulate a return to normal conditions. Internally give 1 drachm doses Nux Vomica, or 2 grain doses Sulphate Strychnia three times a day, until twitching of some of the voluntary muscles occurs; then discontinue for several days; beginning with a smaller dose and increasing until the twitching occurs, is also recommended. The trouble may be incurable.

APHTHA, OR THRUSH. — At certain times, a common disease and seems to be somewhat contagious.

Symptoms.—Animal is dull and does not eat well; has slight cough; is running down. On examination, the mouth, lips, and tongue will be found covered with little blisters, and they may extend down into the throat, stomach, and in some cases into the intestines. The animal may be feverish.

TREATMENT.—

Give the same treatment as with "Stomatitis;" touching the sores with the caustics. Flushing out the mouth with a Carbolic Acid solution—Carbolic Acid, ½ ounce, water, 1 quart—is of value. In flushing out, be careful that the animal does not swallow much of the solution.

INFLAMMATION OF THE TONGUE — GLOSSITIS.—

Causes.—From irritating medicines and foods; or from too rough handling in giving medicines, injury from bit, or from rope put in the mouth, etc.

Symptoms.—Copious discharge of saliva, and on examination the tongue will be found red, swollen and tender to touch, and in some cases protrudes from the mouth, with laceration, abscesses, etc., and if not relieved animal would die of starvation.

TREATMENT.—

In simple cases follow out the treatment as in "Sore Mouth" or "Stomatitis." Severe cases might require the services of a veterinarian. If tongue is cut, the wound should be stitched. In bad cases pump ice-cold water into the mouth continuously with a force pump.

TONGUE HANGING FROM THE MOUTH.—

Causes.—Primarily from projection or sharp edges on the teeth; or from neglected injuries to the tongue, or from a paralyzed condition of the tongue.

Symptoms.—Are obvious.

TREATMENT.—

Examine the teeth and rasp away all sharp edges and projections if any are found. Should the tongue be sore, use remedies as in "Sore Mouth." If tongue is paralyzed, give drachm doses of Nux Vomica three times a day. When it hangs from the mouth as a habit, there is no known remedy. The use of certain bits will sometimes prevent. If it hangs from the side, large, circular leathers attached to the sides of the bit may help.

SLAVERING OR FROTHING—PTYALISM.—This is an excessive or abnormal secretion of saliva.

Causes.—Irregular teeth; something in the food; clover, especially second crop; foreign substances lodged in the mouth; inflammation of mouth or tongue; or the use of some kinds of medicine.

TREATMENT.—

Discover and remove the cause and usually nothing more will be necessary. Astringent washes, as Alum water or Borax water, may be used sometimes to an advantage, applying with a sponge or syringe. A dose of the following is recommended where simple means fail:

Aloes	8 drachms.
Bicarbonate Soda	1 drachm.
Ginger	1 "

Dissolve in 1 pint of water or gruel, and give as a drench; or, give in the form of a ball.

INFLAMMATION OF THE PAROTID GLAND.— This is the salivary gland situated below the ear and between the back part of the jaw bone and neck.

Causes.—They become inflamed occasionally from cold settling in them, or from injury. Disease also accompanies distemper, laryngitis, and pharyngitis.

TREATMENT.—

Bathe in hot water, or apply woolen cloths wrung from hot water, or apply Linseed Meal poultices. If there is fever, give internal treatment recommended for "Laryngitis" If gland suppurates and comes to a point in any spot, open and flush out once a day with Carbolic Acid water:

Carbolic Acid	½ ounce.
Water	1 pint.

Continue poulticing as before for a day or two and then stop poulticing.

THICKENING OF THE PAROTID GLAND.—This is usually called "thick gland."

Causes.—Tight reining; from distemper; or from inflammation of the glands.

Symptoms.—A pronounced thickening behind the jaw bone and below the ear.

TREATMENT.—

Blistering is the best way to get rid of this. Use the following;

Powdered Cantharides	1 drachm.
Biniodide of Mercury	½ "
Lard or Vaseline	1 ounce.

Mix thoroughly and apply to the affected gland.

For applying, see "To Apply a Blister," under "Ring Bone."

In mild cases Iodine Ointment can be used in place of blister; the ointment is made as follows:

Iodine	2 drachms.
Iodide of Potash	½ "
Biniodide of Mercury	20 grains.
Vaseline	1 ounce.

Apply a little once a day and rub vigorously with a rub cloth. Keep slightly irritated.

FISTULA OF THE PAROTID DUCT.—Generally from an injury to the duct where it rounds the lower jaw on the under side, just in front of the angle.

Causes.—A tumor, or piece of food may obstruct the duct, cause inflammation, and as a result the duct breaks through in a new place, and as there is a constant flow of saliva, the opening becomes fistulous.

Symptoms.—If, from an obstruction, there is a sore on the cheek, usually on the outside, but sometimes on the inside, the inner one does little harm, as the saliva is not wasted. The saliva flows more freely during mastication, but is continuous, If from an injury at the underside of jaw, saliva flows from the injury.

TREATMENT.

Clip hair off around the opening, and remove any obstruction or irritation on the inside; see that the natural opening is clear. Scratch edges of external opening to make a fresh wound of it; then apply the following:

Carbolic Acid	1 drachm.
Glycerine	2 drachms.
Flour to make a paste.	

Make into a paste and apply to the wound, and put a cold Linseed Meal poultice directly over it. Dress twice a day, and the fistulous opening will soon close if the natural passage is kept open. A little Tincture of Iodine, or the Iodine Ointment applied to the opening repeatedly may close it. If possible, get a veterinarian to treat the trouble.

INFLAMMATION OF THE PHARYNX—PHARYNGITIS.—The pharynx is that part of the tract that lies in the throat just back of the mouth. It rarely exists unless accompanied with sore mouth, glossitis, or laryngitis.

Causes.—Are from extension of above diseases, or from foreign substances getting lodged there. Same causes as for laryngitis.

Symptoms.—When confined mostly to the pharynx, there is difficulty in swallowing; but little cough unless in trying to swallow; and there is no soreness on pressure over the larynx (large ring of the windpipe.) Increased flow of saliva; difficulty of swallowing liquids in particular, and cough when trying to swallow only, water comes back through the nose, and more or less discharge from the nose.

TREATMENT.—

Same as for "Laryngitis."

PARALYSIS OF THE PHARYNX, OR GULLET.—Commonly called "Paralysis of the Throat." This is a stubborn disease, but fortunately not very common.

Symptoms.—Animal will take food in his mouth and chew it, but cannot swallow; will try to drink, but there is no diminution of water in the pail, and this he will try to do by the hour. Any water getting into the back of the mouth will be returned through the nose. An examination reveals no abnormal conditions, except perhaps parts are flabby to touch. General conditions of animal otherwise at first are good, only as owner would say: "He can't eat."

TREATMENT.—

Blister, or apply stimulating Turpentine and Ammonia liniment behind and under the jaw. Swab the mouth frequently with Chlorate of Potash or Alum, 1 ounce to a pint of water, with a sponge on end of a stick. Give Strychnine in 1 grain doses three or four times a day. If possible give the Strychnine hypodermically. This treatment is recommended by high authority. Another recommends feeding animal with stomach pump, hay tea and making gruels out of chopped oats, new milk and eggs, and pumping it down into the stomach, or giving through a hose with funnel in one end, passed into the stomach; in this way keeping animal alive until the muscles have regained their tone and horse can swallow again.

CHOKING.—Choking is not so common among horses as cattle, but it sometimes occurs.

Causes.—Animal is suddenly startled when eating apples or roots; or, in feeding oats in a narrow, deep manger, a greedy feeder may, by bolting his oats, get choked. Giving eggs without breaking, or balls that are too large or improper shape, are also causes. It may lodge in the pharynx, in middle or neck portion, or in the chest portion near the stomach, each giving different symptoms.

Symptoms.—When in the pharynx, the horse will present symptoms of distress, such as hurried breathing, frequent cough, excessive flow of saliva, sweating, trembling, or stamping of the forefeet, and there may be bloating. Manipulating upper part of throat and examination by hand, will discover obstruction. If farther down, the object will form a tumor on left side of neck, which may be both seen and felt. Symptoms are not so severe; horse will draw himself up, arch his neck, and sometimes utter a loud grunt; has anxious look and tries to vomit; saliva and mucus flowing from the nose. If choke is close to the stomach, the symptoms are still less severe. Horse will eject food or water through nose or mouth, after a few swallows are taken. There are some distress symptoms, cough, and occasionally attempts at vomiting in this form of choke. The probang would determine the question if an obstruction were present.

TREATMENT.—

If in the pharynx or the beginning of the gullet, try and remove through the mouth, putting a gag in the mouth to protect the hand. While one is trying to grasp object, have another press upward on object from below. Give a little oil carefully to lubricate obstruction and gullet. Persevere, as continued effort may get obstacle farther toward the mouth or cause it to be carried on to the stomach. If all means fail, then use the probang in endeavor to push it down. A half-inch hose answers very well for a probang. It can be stiffened, if necessary, by putting twisted wire in it, being sure the wire does not project beyond the lower end. To pass the probang, back the horse into a corner, have a man on each side take an ear in one hand, and one place the other hand on his nose, the other place his hand under the lower jaw. Straighten the head on the neck as much as possible; oil the hose well, pass it into the mouth over the back of the tongue into the gullet; press gently until it enters the gullet, then pass rapidly until it strikes the obstruction; then by gentle but firm pressure try and dislodge it and push it into the stomach. It is some seven or eight feet from the front of the mouth to the stomach. The horse is apt to "choke down" in using a probang; if it occurs withdraw the probang at once. If the obstruction

will not dislodge, mix 1½ teaspoonfuls Fluid Extract of Belladonna with ½ teacupful melted lard, place a funnel in one end of the hose, pass it down onto the obstruction, then elevate the funnel and pour the lard mixture into it; after giving the mixture time to run down onto the obstruction, remove the probang and wait from one-half to one hour, and then try again to dislodge it with the probang. Never use any hard, stiff body for a probang.

If lower in the throat give a little oil carefully, and then manipulate with the hand. If oats, begin at lower part and squeeze off a little at a time. Continue trying for an hour at least before resorting to more dangerous modes of treatment. If the manipulations fail, then the probang may be resorted to. The lower form of choke can only be treated by the careful use of the probang. As a last resort, if in the neck region, the substance is cut down onto, and removed through an opening. Avoiding large blood vessels and nerves, an incision is made down onto the top of the obstruction, the opening being as small as possible and accomplish the object. When done, draw the cut together with catgut or silk and dress it twice a day with Carbolic lotion:

Carbolic Acid	4 drachms.
Water	1 pint.

Feed on sloppy diet for a week or more. A veterinarian should be called for the operation and in all severe cases where possible.

DILATATION OR ENLARGEMENT OF THE ESOPHAGUS, OR GULLET.—

Causes.—Mostly from choking, and is due to a rupture or stretching of the muscular coat of the gullet, allowing the internal or mucous coat to form a pouch.

Symptoms.—Horse will be able to eat a few mouthfuls without apparent distress; then he will suddenly paw, contract the muscles of his neck, and eject a portion of the food through nose or mouth. As the dilatation thus empties itself the symptoms subside, only to reappear as he again takes solid food; or each bolus as it is swallowed may lodge in the enlargement, to be

pushed out by the one following; in this case a little pressure or a swallow of water causes the bolus to pass on.

TREATMENT.—

Is not very satisfactory; a drachm of Fluid Extract of Belladonna and 2 drachms of Alum, two or three times a day, may help.

GOITRE, OR ENLARGEMENT OF THE THYROID GLAND.—This gland is situated on the under side of the neck, about five to eight inches below the angle of the lower jaw, on each side of the windpipe.

Cause.—The cause is not known.

Symptoms.—Gland is enlarged; it is movable, insensitive, and grows slowly.

TREATMENT.—

Wash once a day with hot water and soap; then when dry, apply the Iodine Ointment, as recommended in "Thickening of the Parotid Gland." One-half drachm of Tincture of Iodine can be injected into the enlarged gland with a hypodermic syringe. Treatment should begin early.

SWELLING AROUND HEAD AND THROAT.—This is sometimes noticed when a horse is first turned out to pasture for a few days, and might be thought something serious.

Cause.—It is caused by a flow of blood to the head when horse has his head to the ground, induced by the change of feeding from a manger to the ground.

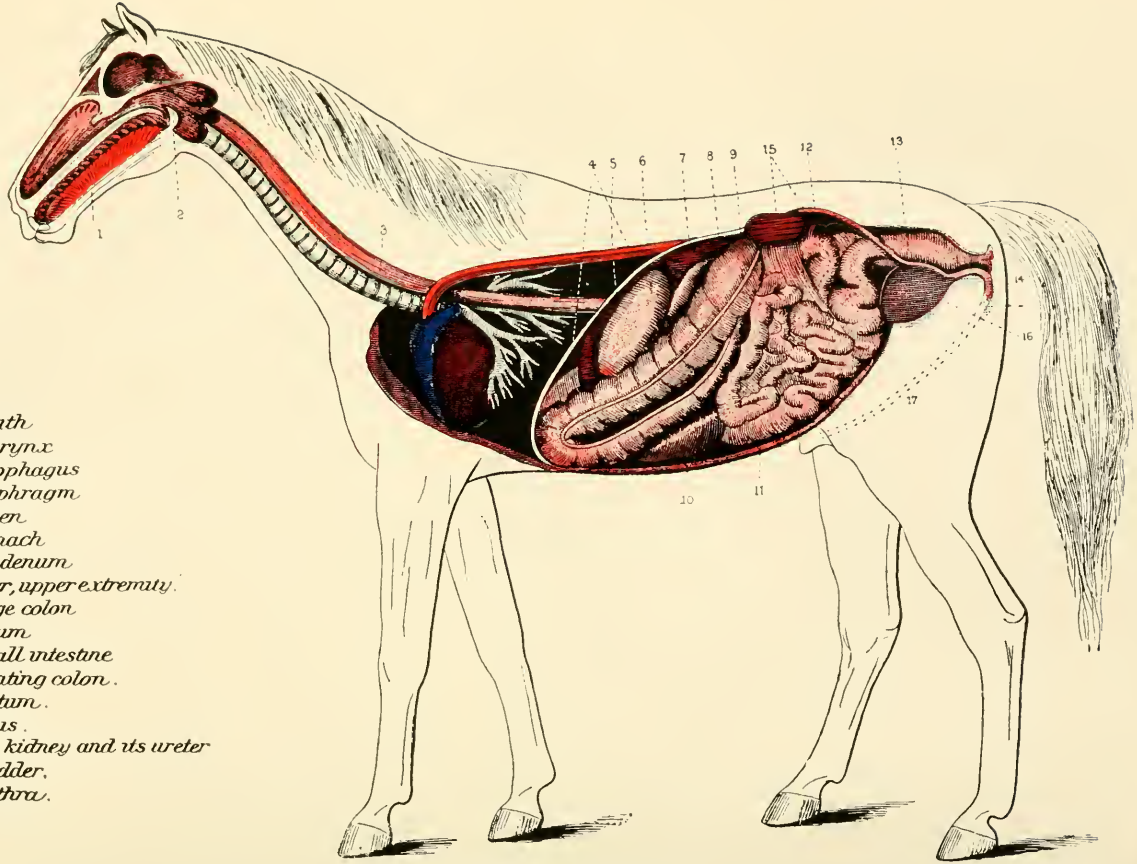
Symptoms.—There is apparent swelling around jaws and throat. When examined there is no tenderness, and animal is sound in every other way. If brought in and fed where he will hold his head higher, the enlargement disappears.

TREATMENT.—

In many cases no treatment is needed, but if the blood is not in the right condition, give him a few doses of the following:

Nitrate of Potash..... 4 ounces.
Sulphur..... 4 "

Mix and give 1 tablespoonful every night and morning; a light laxative may also be of value.



1, *Mouth*
2, *Pharynx*
3, *Œsophagus*
4, *Diaphragm*
5, *Spleen*
6, *Stomach*
7, *Duodenum*
8, *Liver, upper extremity.*
9, *Large colon*
10, *Cæcum*
11, *Small intestine*
12, *Floating colon.*
13, *Rectum.*
14, *Anus.*
15, *Left kidney and its ureter*
16, *Bladder.*
17, *Urethra.*

DIGESTIVE APPARATUS.

DISEASES OF THE STOMACH AND BOWELS

IMPACTION OF THE STOMACH—STOMACH STAGGERS—GORGED STOMACH.—These are terms given to the stomach when it is so distended with food as to lose the power of contracting on its contents.

Causes.—Overfeeding, especially after a long fast; getting access to the grain bin and eating ravenously; getting into grain field.

Symptoms.—Horse becomes dull and drowsy; slight colicky symptoms; rarely lies down; carries his head extended and low, nearly to the ground. Dullness increases, eyes partially closed; vision impaired; presses his head against the manger and sides of stall; paws or even climbs with his forefeet. Respiration less frequent than in health, and pulse slow and sluggish. Symptoms increase in severity; he becomes delirious; covered with cold sweat; trembles violently; slobbers or vomits a sour, fermenting mass; staggers from side to side when moved, or plunges violently about until he drops dead. Symptoms resemble somewhat "mad staggers," but if one gets the cause—ravenous eating after a fast, etc.—there need be no confounding of diseases.

TREATMENT.—

Those drugs should be given which will stimulate the stomach to activity. Give the mixture recommended for "Colic;" repeat in from one-half to one hour, and again in two hours, and then once in three hours. If suffering is intense, give from 3 to 5 grains of Morphine and repeat as conditions indicate. Drachm doses of the Fluid Extract of Nux Vomica once in two or three hours, in addition to the colic mixture, is good. If bloating is present, give the drugs as recommended in "Tympanites of the Stomach." After recovery, give for a week or two the tonics recommended under "Chronic Indigestion."

A purgative of Barbadoes Aloes or ¾ pound of Epsom Salts should be given after the acute symptoms have passed. If colic

mixture is not at hand, stimulate the stomach to action by giving ½ ounce doses Cayenne Pepper or Jamaica Ginger. Injections into the rectum of:

Turpentine..... 2 ounces.
Linseed Oil..... 8 "

may stimulate the bowels to act, and thus in a measure relieve the stomach. Cold applications to the head for the cerebral symptoms may be of benefit in some cases.

When an animal overeats, give treatment at once; do not wait for symptoms to appear.

TYMPANITES OF THE STOMACH — ACUTE INDIGESTION. — This disease corresponds to "hoven" or blown in cattle.

Causes.—Overloading the stomach with young, succulent, growing food; overfeeding, particularly if given immediately before or after hard work. Some think to fit their horse for a hard journey by giving an extra allowance of oats or other food just before starting. A violation of any of the correct principles of feeding.

Symptoms.—Horse grows dull and listless; sweats profusely; attempts to lie down; head is carried forward and downward; if checked up, is heavy on the reins; stumbles or blunders forward, and sometimes falls. If looked at carefully, is seen to be unusually full over the posterior ribs; flanks may also be distended. On placing the ear to the horse's windpipe a distinct metallic sound can be heard, as of air rushing through the windpipe; it is gas coming up through the gullet. Such cases are rapid in their course and often fatal.

TREATMENT.—

Must be prompt and energetic. Give the mixture recommended for "Colic" and in addition to stop the bloating give:

Hyposulphite of Soda..... 4 ounces.
Water..... ½ pint.

Or:

Salicylic Acid..... 4 drachms.
Raw Linseed Oil..... 4 ounces.

Repeat in one-half hour.

An ounce of Turpentine in a pint of Oil is helpful in case of bloating. If medicines fail, pass one-half inch hose into the stomach as described under "Choking." Charcoal in large doses is good.

After the acute symptoms have passed, give Aloes or Salts as in preceding disorder, and also follow with the digestive tonic.

RUPTURE OF THE STOMACH.—This mostly occurs as the result of engorged or tympanitic stomach; and from the horse throwing himself violently when so affected. It may result from disease of the coats of the stomach, gastritis, stones or calculi, tumors, or anything closing the opening of the stomach into the intestines, and from very violent pulling, or jumping, after animal has eaten heartily of bulky food.

Symptoms.—Are not constant or reliable. Horse will sit on haunches, and turn up his nose, as in "Colic" or "Enteritis;" will try to vomit, and this is a characteristic symptom. As case progresses horse will often stretch forward the fore legs, lean backwards and downwards until the belly nearly touches the ground, and then rise up again with a groan, after which the fluid from his nostrils is issued in increased quantity. Pulse fast and weak; breathing hurried; body bathed in clammy sweat; limbs tremble violently; horse reels and staggers from side to side, and ultimately dies.

TREATMENT.—

The postmortem reveals the exact condition. There is no treatment that is any use whatever. There is a possibility, however, of a mistake in diagnosis, and Powdered Opium in 1 drachm doses, or 1 ounce doses of Laudanum may be given every two or three hours, to keep the stomach as quiet as possible.

INFLAMMATION OF THE STOMACH—GASTRITIS.—This is an inflammation of the mucous membrane lining of the stomach.

Causes.—Generally due to mechanical irritation, or to giving irritant or corrosive poisons in too large doses, or without sufficient dilution.

Symptoms.—Are not well marked; there are febrile symptoms, the temperature ranging from 104 to 106 degrees; the pulse is rapid, small and hard; colicky pains; attempts at vomiting; intense thirst. When produced by poisons there will be symptoms referable to that particular poison. If due to salts of Lead, there is difficult or labored breathing, abdominal pains, partial paralysis of extensor muscles, tottering gait, convulsions and death. Gradual lead poisoning would differ somewhat. Out of condition; loss of appetite; staring coat; constipation; watery swellings under the jaws; gray or blue line along the margin of the gums; progressive paralysis, noted at first in anterior extremities; colicky pains. Chronic poisoning may be expected where horses are pastured near paint works, or around newly painted buildings, where paint kegs are left in the fields, where horses may get small particles of lead in the food, where soft water runs through lead pipes, or where drinking water is drawn from cisterns or wells containing lead.

TREATMENT.—

If from acute lead poisoning, give 30 to 60 drops Sulphuric Acid, well diluted with water, milk, white of eggs, oils, and Linseed gruel or tea. If chronic from gradual lead poisoning, give Epsom Salts in from ½ to 1 pound doses. Iodide Potassium in 1 drachm doses, two or three times a day is good. If not due to lead, give the following:

Morphine	3 to 5 grains.
Subnitrate of Bismuth	2 drachms.
Linseed Meal Gruel	1 pint.

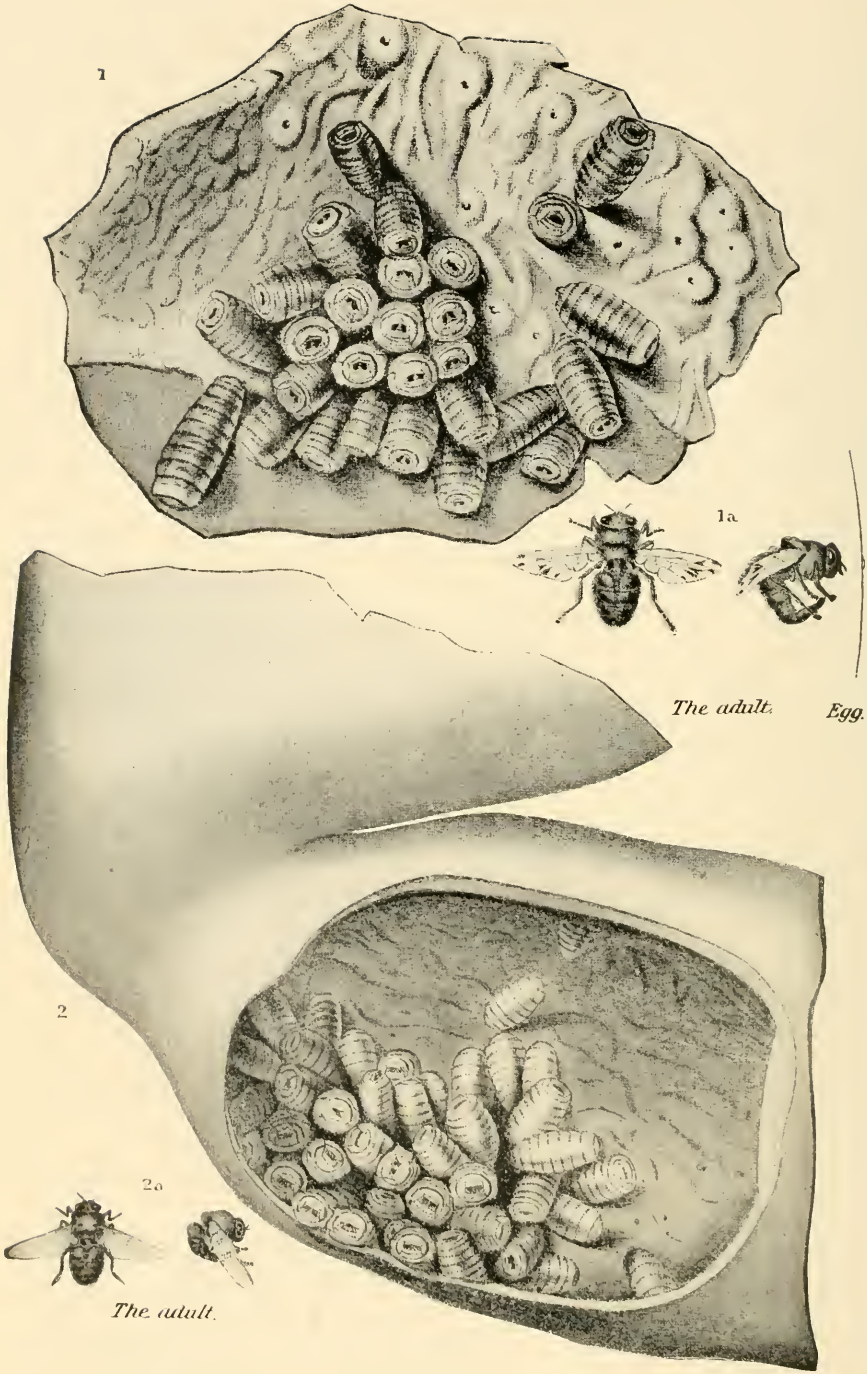
Give as one dose; repeat three to five times a day.

Eggs in milk are also good. For the fever give:

Fluid Extract Belladonna	1 drachm.
Fluid Extract Aconite	10 drops.
Saltpeter	2 drachms.

Give in the gruel three or four times a day.

Give water in small quantities frequently. Follow recovery with the tonics as in preceding disorders.



BOTS.

(1) BOTS IN THE STOMACH. (2) BOTS IN THE DUODENUM.

BOTS.—The common gad-fly (gastrophilus equi) attacks horses in summer, its purpose being not to get food but to deposit its eggs. The parts selected being the shoulder, base of neck, and fore legs, especially about the knees, for in these places the horse will have no difficulty in reaching the eggs with his tongue. When the animal licks the spots where the eggs have been deposited, the heat and moisture hatches them out, and the little bots are transferred to the stomach, where they attach themselves to the coat of the stomach by two little hooklets on the head, and there remain for several months until they reach their growth as bots; they sometimes attach themselves at other points along the digestive tract, as in the pharynx, or in the intestines. When this time arrives, generally in the early spring, they let go their hold and are carried out in the feces. They then bury themselves in the earth for a period of six or seven weeks, and finally emerge as perfect winged insects to carry forward the work of depositing eggs. They have no mouth parts and do not bite the horse, and yet they cause a great deal of annoyance.

The opinion that is commonly entertained that bots cause colicky pains is erroneous. All kinds of treatment, varied and heroic has been resorted to by horsemen to cure the animal of the so-called ailment, such as slapping the horse on the belly to make the bots let go, etc., but the universal verdict of veterinarians is, that it is rare that bots produce any appreciable disturbance whatever. The opinion has been sometimes given out in a case where the stomach has been ruptured through distension by gases, bots being present, that "bots have eaten through the stomach." Bots never do this. They might be in such numbers as to slightly interfere with digestion, or might at once let go in such a mass as to clog the opening of the bowels, or be attached in such numbers around the opening as to partially clog it, but such instances would be rare indeed.

TREATMENT.—

Prevention is the best treatment. Keep the legs and shoulders free from the eggs during summer and autumn. Medicines will not loosen them from the stomach. In May and June when the bots loosen their hold and come away in large numbers, remember

it is the natural course of events, and that the animal will soon be free from them. Ordinarily it is not necessary to even remove the eggs, but when present in large numbers it would be well to wash the parts once or twice a week with warm soap suds. The warm water will hatch the bots and they will be washed off. By examining the eggs with a hand lens, those that have hatched can be recognized, as the little cap at one end is off.

CHRONIC INDIGESTION.—The disturbances of digestion included under this head are not so pronounced as to produce colic, yet as this is one of the most common troubles of the alimentary tract, it deserves more than passing attention.

Causes.—Improper food and feeding at improper times; irregular or decayed teeth; bolting the food; overeating; too much rough food; defective secretions, etc., are causes of this disorder.

Symptoms.—Irregular appetite, refusing food at times, and eating ravenously at others — eating everything within reach. Appetite is also depraved, eating unusual things, as soiled bedding, wood, his own feces; bowels irregular; food passing with but little change—grain whole and hay in impacted masses; frequent passing of wind with a sour odor; light attacks of colic. Animal loses flesh; sweats easily, tires easily, loses spirits. Skin presents a dry, hard appearance, and is tight (hide-bound). Hair is long, harsh and rough. If all or a part of these symptoms are present, the trouble is without doubt indigestion.

TREATMENT.—

First look to the cause and remove it. Give water to drink before feeding. Gradually change the feed to another kind, and give the best of food—feed a balanced ration; do not overfeed, and do not allow animal to eat bedding or dirty food of any kind. If in season, turn out to grass for three or four months. Examine the teeth carefully, rasping down or extracting if case requires. If due to bolting food, feed in a large manger, where the grain can be spread so thin as to compel horse to eat slowly. Carrots, turnips, or apples are good. A physic given at the outset is of benefit—an ounce of Aloes, or a pint of

Linseed Oil. Give regular exercise, but do not overwork. Use a mixture of oats, bran and linseed meal, instead of corn, for a grain ration; clover instead of timothy hay. Medicinally, use the following:

Gentian	8 ounces.
Bicarbonate Soda	8 "
Nux Vomica	4 "
Arsenic	1 drachm.

Mix thoroughly; dose, tablespoon level full morning and night in moistened grain.

At noon give the following:

Sulphate of Iron	4 ounces.
Saltpeter	4 "

Mix thoroughly; dose, tablespoon level full, given in moistened grain at noon.

In some cases the following will give better results than the Iron and Saltpeter mixture, and can be used instead:

Nitrohydrochloric Acid	1½ ounces.
Liquid Chloride of Iron	1½ "
Water to make	1 pint.

Dose: 1 ounce in 4 ounces of water; give in grain.

Give the medicine for two or three weeks, withhold a week and then give again, continuing in this manner until cured. These cases often require treatment for six months or a year.

SPASMODIC, OR CRAMP COLIC.—The name given to that form of colic produced by contraction or spasm of a portion of the small intestines.

Causes.—Indigestible food; sudden changes in feeding, or feeding at improper times; foreign bodies, as nails or stones; large drinks of cold water; driving horse through deep streams in heated condition; cold rains; drafts of air; worms, etc.

Symptoms.—These should be studied carefully in order to distinguish from other forms of colic requiring quite different treatment. Spasmodic colic begins suddenly; if feeding, horse will stop abruptly, stamp impatiently, and look backwards. Soon shows pain by pawing, suddenly lying down, rolling, and getting up. Then an interval in which he resumes feeding. In a little while pains return and are increased, only to pass off for a

time. As attack progresses the intervals of ease become shorter, and pain more intense. Animal will throw himself down, roll over and over, jump up, whirl about, drop down again, paw, or strike with the front feet, steam and sweat, make frequent attempts to pass water, and penis partially erected. Only a small amount of water is passed, as bladder is so frequently emptied. The pulse is about normal in the intervals, but runs up during the attacks. The temperature remains normal, or nearly so. Pressure on the bowels seem to relieve, which is not the case in inflammation.

TREATMENT.—

Give a roomy box stall, bedded, and let animal maneuver at will. Do not run the animal; a little walking exercise is not hurtful. Anti-spasmotics are indicated. Give 1 ounce Chloral Hydrate as a drench in ½ pint of water. Another good remedy is:

Sulphuric Ether	1 ounce.
Laudanum	2 "
Linseed Oil	½ pint.

Still another is:

Alcohol	2 ounces.
Sulphuric Ether	1 ounce.
Fluid Extract Belladonna	1 drachm.
Water	½ pint.

A favorite remedy with many is:

Sweet Spirits Niter	1 ounce.
Laudanum	1 "
Ginger	1 tablespoonful.
Baking Soda	1 "
Water	1 pint.

Mix, and give as a drench.

The following is also a good colic mixture:

Aromatic Spirits of Ammonia	½ ounce.
Sulphuric Ether	½ "
Fluid Extract Jaborandi	2 drachms.
Fluid Extract Calibar Bean	½ drachm.
Fluid Extract Belladonna	1 drachm.
Water to make	½ pint.

Give as one dose; repeat in one-half to one hour if necessary, and again in an hour if circumstances require.

If any bloating is present, give in addition the remedies recommended in the next disorder.

One-half pint Whiskey in hot water is good when nothing else is at hand. Cloths wrung out in hot water to which a little Turpentine has been added and applied to the abdomen if animal is quiet enough, will be of use in severe cases, or the belly may be rubbed with stimulating liniments, or Mustard paste. Injection per rectum of warm, soapy water, or salt and water, lukewarm, and from 3 to 6 quarts in amount, will aid in the cure. Repeat in one-half hour if necessary. Always follow a recovery from colic with from a pint to a quart dose of Raw Linseed Oil. And give the tonics as in "Chronic Indigestion" for a week or two.

FLATULENT COLIC—TYMPANITES—WIND COLIC—BLOAT.—

Causes.—Sudden changes in food; too long fasting, and food given while horse is exhausted; large quantities of green food; sour, indigestible food; irregular teeth; or anything that produces indigestion

Symptoms.—Are not so suddenly developed, nor so severe as in "Spasmodic or Cramp Colic." Resembles "Acute Indigestion," only the seat of the trouble is in the bowels instead of the stomach. At first horse is dull, paws slightly, and may or may not lie down. Pains are continuous from the start; belly enlarges, and by striking it in front of haunches, a drum-like sound is heard, most noticeable on the right side. Symptoms are aggravated if not relieved, and in addition there is difficult breathing; profuse sweat; trembling of front limbs; sighing respiration; staggering and death.

TREATMENT.—

Give the "Colic" mixture the same as in "Spasmodic Colic," and in addition the following to correct the bloating:

Hyposulphite of Soda	4 ounces.
Water	½ pint.

Or:

Salicylic Acid	4 drachms.
Raw Linseed Oil	½ pint.

If neither of these are at hand, 1 ounce of Turpentine in a pint of Oil is of value; repeat these in about half an hour, and again in an hour if necessary.

Give injections per rectum and use applications to abdomen as in "Spasmodic Colic."

Give a roomy place, but do not allow horse to throw himself violently; if he lies down carefully, let him do so and roll.

If the medicines do not stop the bloating, resort to tapping, using the horse trocar and canula. Tap in the right flank in the center of the triangular space between the point of the hip and the last rib. Wash the place first with Carbolic Acid solution:

Carbolic Acid	½ ounce.
Water	1 pint.

Also wash the instrument in the same; have the point of the trocar sharp; standing well forward, place the point of the trocar at the right place, direct it downward and forward and press it in nearly the whole length; withdraw the trocar and the gas will escape through the canula; if the gas does not come out, withdraw the canula part way, change the direction and insert again. Leave the canula in until all the gas escapes. If necessary to tap a second time, do so a little to one side of the other place. After removing the canula, wash the place with the Carbolic solution.

Give the same after-treatment as with "Spasmodic Colic."

INFLAMMATION OF THE BOWELS—ENTERITIS.—This is an inflammation of the lining of the bowels, and may extend to, and involve the muscular and even serous coats.

Causes.—Food that has sand or clay in it; continuation of colic; corrosive poisons; exposure to cold after an exhaustive drive; driving through deep streams of cold water when heated; musty, bad food; and over-feeding.

Symptoms.—The early symptoms resemble those of "Colic," but in the course of an hour or two the following will be noticed: Membranes of nose, mouth, and eyes are congested and reddened; mouth hot and dry; respirations are increased; sweating; pulse hard and rapid; temperature 103 to 106 F. This distinguishes it from "Colic." Colic pains are continuous. Horse

walks about the stall, paws, lies down carefully, may start to lie down, get down part way, but get up again, and when down, frequently turns himself upon his back by side of stall and remains for sometime. Bowels are usually sluggish and inactive, unless caused by irritant food or medicines, in which case purging or bloating may be present. The high pulse, fever, continuous pain, which is increased on pressure, position of horse when down, coldness of ears and legs, etc., are characteristics of the disease. Duration of complaint is usually from ten to fifteen hours, but may extend over a longer time. Very frequently fatal.

TREATMENT.—

Give every three to four hours:

Powdered Opium	1 to 2 drachms.
Fluid Extract Belladonna	1 drachm.
Fluid Extract Aconite	10 drops.
Saltpeter	2 drachms.
Water	½ pint

Mix and give as one dose.

Or, the following may be used:

Laudanum	2 ounces.
Fluid Extract Aconite Root	10 to 15 drops.
Baking Soda	1 tablespoouful.
Fluid Extract Belladonna	1 drachm.

Mix and give as a drench in ½ pint of water, repeating every two or three hours until relieved.

As a rule, purgatives and injections should not be given, as the bowels should be kept quiet. Blankets wrung out in hot water and applied to the belly, and covered with a dry blanket, changing to keep hot, are good; or stimulating liniments, or Mustard paste, rubbed over the abdomen, with hot salt in a bag applied over the kidneys, will be of benefit. During convalescence give linseed tea, oatmeal gruel, bran mashes, grass if in season, avoiding all hard indigestible foods; if the bowels do not act, encourage by walking exercise and injections of soapy water in rectum. If these fail, give a pint of Linseed Oil and repeat every six to eight hours until bowels respond. Use the tonic as for "Chronic Indigestion" for a week or two.

PERITONITIS.—This is an inflammation of the lining of the abdominal cavity, and of the outer covering of the bowels. Duration, a week or more, but may kill in a few hours.

Causes.—Wounds in the abdomen; severe blows or kicks; castration; tapping and other operations; exposures of various kinds; and extension of inflammation from organs covered by the peritoneum.

Symptoms.—Generally preceded by a chill; not disposed to move; seems stiff and sore; paws with front feet, and strikes at belly with hind ones; lies down carefully, but as pain is increased, remains standing most of time; constipated; pressure on belly gives pain; horse will bite, strike or kick, if so disturbed. Temperature is higher than normal—103 to 104 F.; pulse quickened—70 to 90 a minute, and is hard and wiry. The symptoms resemble quite closely those of "Inflammation of Bowels." If extensive is generally fatal; if death does not occur soon, disease may assume a chronic form, and there is an effusion of water in the belly cavity, constituting what is known as ascites or dropsy of the abdomen, in which case a baggy condition of the abdomen is produced.

TREATMENT.—

Give from 1 to 2 ounces of Laudanum every two to four hours to allay the pain, and also the following to control the inflammation:

Alcohol	4 ounces.
Fluid Extract of Aconite	1 drachm.
Fluid Extract of Belladonna	1 ounce.
Saltpeter	2 ounces.
Water to make	1 pint.

Shake; dose, 2 ounces three to five times a day.

If the temperature gets high, give one drachm of Acetanilid and 1½ ounces of Alcohol in ½ pint of water twice a day. Use hot applications to the abdomen, as in "Inflammation of the Bowels," also the liniment or Mustard paste; these are very important in this disorder. If the animal shows a desire for food, give a little that will be easily digested. After two or three days give 20 to 30 drops of Fluid Extract of Digitalis with each dose

of the above mixture. If the disease follows castration, flush out the wound well two or three times a day with a Carbolic Acid solution:

Carbolic Acid	½ ounce.
Water	1 pint.

Use a syringe in flushing out. If a yearling colt, use about one-fourth the above dose of medicine internally.

Use injections to unload the bowels and oil to move them during convalescence.

The treatment in case the serum collects in the cavity will be found under "Ascites."

IMPACTION OF THE LARGE INTESTINE.— This is a very common trouble and one which if not promptly recognized and treated, results in death.

Symptoms.—There are at first slight abdominal pains, resembling mild case of "Colic," which may disappear for a time, to reappear with more violence; feces are passed in the early stages, but in smaller quantities and more dry; abdomen feels full, but not distended with gas; horse paws and looks at his sides. A striking symptom is that he will lie flat on his side, head and legs extended, but raises head to look at flanks, and remaining in this position from five to fifteen minutes at a time, seemingly in this shape easiest. Gets up, walks about the stall, paws, looks at his sides, backs up against stall, pressing it with his tail, or rubs his tail, (a very characteristic symptom), but soon lies down again. Bowels cease to move after twenty-four hours; at first temperature is normal, but rises as inflammation sets in; pulse is accelerated and gets harder as disease advances. If not relieved horse may live a week, or even two weeks, but may not live over four or five days, dying as the result of inflammation.

TREATMENT.—

Consists of moving the bowels and preventing inflammation. Give the following:

Aloes	1 ounce.
Calomel	1 drachm.

Give in form of a pill, or in a pint of Linseed Meal gruel.

Also give the "Colic" mixture three or four times a day, adding to it each time 1 drachm of Fluid Extract Nux Vomica. Also give two or three times a day a pint of raw Linseed Oil. If the dose of Aloes does not act in the course of thirty-six hours, repeat, using three-fourths of the dose, or give three-fourths pound of Epsom Salts, and repeat again if no movement is produced in thirty-six hours more. Give injections per rectum, as in "Colic," repeating four or five times a day; the following can be substituted for the water injection once or twice a day.

Turpentine	1 ounce.
Glycerine	2 ounces.
Raw Linseed Oil	1 pint.

Rubbing or kneading the belly, and the application of stimulating liniments, or strong mustard water, will also favor expulsion of feces. If pain is intense, give from 3 to 5 grains of Morphine three or four times a day. Give occasional walking exercise; give all the water the animal will drink; scalded oats or bran mash, if food is desired. If recovery does not take place in the course of four to six days, death is apt to result, but not necessarily so. As a last resort, 20 to 30 drops of Croton Oil may be given in a pint of Linseed Oil. Follow recovery with digestive tonics.

DIARRHEA, OR SUPERPURGATION.—This is the opposite of constipation.

Causes.—Eating musty or moldy food; drinking stagnant water; bad condition of teeth; eating irritating substances; being kept in low marshy pastures; exposure during cold nights; low, damp stables; or to some diseased or inflammatory condition of the intestinal canal, or some of the internal organs attached. Some horses are predisposed to it. Superpurgation is from an overdose of physic.

Symptoms.—Frequent evacuations of liquid manure, with or without pain; loss of appetite; emaciation, etc.

TREATMENT.—

At times this is simple, but requires care and judgment. If from bad food or conditions, change them. If from some irritation in the intestines, give a pint to a quart dose of Oil, and

the trouble will generally disappear with the operation. If, however, it continues, give scorched wheat flour in water, starch water, white oak bark tea, a teaspoonful of Copperas, or ½ drachm doses of Sulphuric Acid in ½ pint of water twice or thrice daily. A dose of 1 drachm of Opium, or 1 or 2 ounces of Laudanum, and ½ ounce Subnitrate Bismuth, repeated three times a day, is very good. Where there is no reason to suspect irritation the following will be found beneficial:

Tincture Catechu..... 1 ounce.
Ginger..... 1 tablespoonful.
Baking Soda..... 1 "

Mix and give in 1 pint coffee about as used at the table, repeating every four and five hours until relieved.

If other remedies fail give one ounce of the following:

Corrosive Sublimate..... 5 grains.
Water..... ½ pint.

Repeat every two hours until relieved.

Give water to drink, but in small quantities, and in the water put a handful of wheat flour. Follow with digestive tonic as in "Chronic Indigestion."

If from superpurgation, give flour and water to drink, and if this does not check, then give the same as in diarrhea. In addition to this give Brandy in 2 to 4 ounce doses with milk and eggs four or five times a day.

BLOODY FLUX, OR DYSENTERY.—This disease is characterized by coffee-colored or bloody discharges, that are very offensive in odor, and are passed with much straining.

Causes.—Most common cause is keeping young horses in particular, for a long time on low, wet marshy pastures without other feed; exposure during wet weather; decomposed foods; stagnant water; and as a sequel of a severe attack of diarrhea.

Symptoms.—A chill is the initial symptom, but this may pass unnoticed. Discharges are offensive and liquid, with shreds of membrane and blood; much straining; horse lies down a great deal; pulse and temperature higher than normal; may or may not eat, but rapidly loses flesh and becomes a sorry looking object. Thirst is a prominent symptom.

TREATMENT.—

Care and feed are most important in this disease. First put in dry, warm, well-ventilated stable. Give frequent rubbings of the surface of the body, and blanket, with bandage on legs. Water must be given in small quantities, and food that is light and easily digested. First give ½ to 1 pint of Castor or Linseed Oil and 2 ounces Laudanum. Follow this with the same treatment as for "Diarrhea." If animal becomes weak, give:

Alcohol..... 1 ounce.
Fluid Extract of Belladonna..... 1 drachm.
Water.....½ pint.

Give as one dose; repeat three times a day.

Follow recovery with the digestive tonics as in "Chronic Indigestion."

TWIST IN THE BOWELS—GUT-TIE—VOLVULUS.—These are terms applied to the bowels when twisted or knotted.

Cause.—An uncommon accident, and results from the way a horse throws himself about when attacked with spasmodic colic, or sometimes, perhaps, in rolling.

Symptoms.—It is very hard to be sure of this disease, as symptoms are similar at first to impaction of the bowels, and then to inflammation of the bowels. There are no passages; animal sits on his haunches, sweats and seems in great distress; pulse grows weaker and weaker; there is slight bloating; bowels become inflamed where twist is, and death results.

TREATMENT.—

If sure of the case, little can be done but to make animal easy by giving Powdered Opium in 1 to 2 drachm doses every three or four hours, or in place of this, 1 ounce of Laudanum every hour or two. In rare instances bowel rights itself and animal recovers.

INTUSSUSCEPTION, OR INVAGINATION.—This is the slipping of a portion of the intestine into another, like a

partially turned glove finger. It may occur at any part of the bowel, but is most common in the small intestines, or where the small intestine empties into the large intestine.

Causes.—Most likely to occur in horses that are suffering from spasm of the bowels, or where a small portion of gut is paralyzed. May also occur in any abdominal trouble, as "Diarrhea," "Inflammation of the Bowels," etc.

Symptoms.—There are no characteristic symptoms; in some cases none except constipation. Colic pains, more or less severe, with no passages of dung, are observed. Severe straining is sometimes noted; as disease advances, profuse sweat, sighing, anxious countenance, and cold ears and legs are attendant. In some cases the part slipped into the other sloughs off and is passed out in the dung. The parts make a new union and horse recovers.

TREATMENT.—

As the case cannot be definitely diagnosed, the same treatment as for "Impaction of the Intestines," or "Inflammation" is used, but the treatment is unsuccessful, the animal dying, and a postmortem reveals the true condition.

BALLS FOUND IN THE BOWELS—INTESTINAL CALCULI.—These are generally found in the large bowels, though they may be found sometimes in the small intestines. May weigh from 1 to 10 pounds; be single or multiple, and differ much in make-up and appearance. Some are soft, some porous, and some hard and stone-like. Hair balls, so common in cattle, are rare in horses.

Causes.—Feeding sweepings of a mill floor; swallowing nails, pieces of wood, or something of that kind. On some of these foreign bodies, as a nucleus, layers are formed around until, in some instances they reach very large sizes, and obstruct the bowels, causing inflammation and death.

Symptoms.—Are those of obstruction of the bowels. There are no characteristic symptoms, but some weight is given to symptom of sitting on the haunches, like a dog, though this occurs in other diseases.

TREATMENT.—

In first symptoms, give a good dose of physic, and follow with treatment as for "Impaction of the Intestines," and in cases where the disease is suspected, oil hand and pass it into the rectum, and if ball is found, remove it with the hand. Postmortem reveals the true condition.

TUMORS OR ABSCESSES IN THE RECTUM, OR BACK BOWEL.—

Causes.—From constipation; or from injury to parts in treatment.

Symptoms.—Are most marked when passing manure. There is severe pain in passing, and in some cases horse will lie down on account of distress. If tumor or abscess is large, there will be straining, but no passages.

TREATMENT.—

If there is an abscess, and examination shows it is ready to open, do so, using a small knife or lance, allowing matter to escape. If a tumor, and can be reached, remove by cutting it off. The after-treatment is to give raw Linseed Oil, and feeding boiled flaxseed in the feed to keep the bowels loose. A veterinarian best be employed for the operations.

PROTRUSION OF THE RECTUM, OR BACK BOWEL.—

Causes.—Jumping fences and getting half way over; from excessive bloating in "Wind Colic;" from "Diarrhea;" and straining in "Constipation." Also occurs in foaling and in castration of an old stallion.

Symptoms.—Are obvious; large red tumor at anus.

TREATMENT.

Wash bowel with cold water; place a twitch on the horse's nose, and have front leg held up so he cannot kick; oil the bowel with:

Olive Oil	3 ounces.
Laudanum	1 ounce.

Commence returning the bowel at the anus, and gently return it; shove the parts well back in with hand and arm, and have some one hold his tail down tight for an hour or more, or until he stops straining, after the bowel is replaced. It is well, also, to have hind parts raised by straw or boards under the hind feet. Give the following to move bowels and relieve pain:

Raw Linseed Oil	1 quart.
Laudanum	1 ounce.

Shake together.

Feed soft food, with boiled Linseed Meal in it to keep bowels loose. Give 3 to 5 grains of Morphine and 1 drachm Fluid Extract Belladonna three or four times a day to stop straining. Also prepare the following:

Alum	½ ounce,
Laudanum	1 "
Warm water	1 pint,

And inject into the rectum three times a day. If caused by constipation, treat as for that disease.

PILES—HEMORRHOIDS.—Not a common condition, but sometimes occurs.

Causes.—Constipation, irritation or injuries, or from severe straining in dysentery.

Symptoms.—After manuring, bright red irregular tumors are seen in rectum. They may be visible at all times, or be seen when horse is down.

TREATMENT.—

Attention should be paid to bowels; they should be soft, but purging should be avoided. If tumors protrude, wash them with warm water 1 pint, Alum 2 ounces, and then return them. Inject the same solution into the rectum. Give the animal the digestive tonics as recommended for "Chronic Indigestion."

DROPSY OF THE BELLY—ASCITES.—This is a collection of liquid in the belly cavity. It may be clear, but generally is yellowish or reddish in color.

Causes.—Generally a result of other diseases, as acute or chronic peritonitis, and diseases of liver and kidneys.

Symptoms.—Slight tenderness on pressure; awkward gait in hind legs. Horse is dull and may have slight colic pains, shown by looking back and striking belly with hind feet. Bowels alternately constipated and loose, but diarrhea at last. By tapping on the belly and sides, there is a dull sound, and it extends to same height on both sides. By suddenly striking or pushing the belly, the sound of liquid can be heard. In advanced cases the horse becomes pot-bellied, and dropsical swellings are seen on belly and legs.

TREATMENT.—

Encourage appetite by giving the best of food to eat, and gentle exercise. Then give the following:

Fluid Extract of Digitalis	6 drachms.
Fluid Extract of Nux Vomica	1½ ounces.
Iodide of Potash	1 ounce.
Nitrate of Potash	3 ounces.
Water to make	1 pint.

Shake. Dose, 1 ounce three times a day.

In severe cases tapping is resorted to by puncturing the floor of the abdominal wall with a small trocar and canula and allowing the fluid to flow off; but this calls for the services of a veterinarian, if one can possibly be secured.

LONG ROUND WORMS (LUMBRICI).—This is a worm that infests chiefly the small intestines, and is much like the common earth or angle worm in appearance, except it is white to reddish in color, and in length varies from four to twelve inches.

Symptoms.—Colic pains are noted at times, or there may be switching of the tail, frequent manuring, slight straining, itching of the anus, and rubbing tail or rump against stall or fence; evidences of indigestion; is in poor condition; does not shed his coat; is hide-bound and pot-bellied; appetite is depraved and horse is licking walls, eating earth, and is particularly fond of salt. Bowels irregular; rubs nose against walls or stall as though it itched; a characteristic whitish mold-like substance below the anus. The best evidence is worms in the manure that is passed. Only part of these symptoms will be present, except in bad cases.

INTESTINAL WORMS.

TREATMENT.—

Give the following:

Turpentine	1 ounce.
Raw Linseed Oil	1 pint.

Shake together.

Repeat Oil and Turpentine every second day for a week. Give, in addition, 1 teaspoonful of a mixture of equal parts of Sulphate of Iron and Sulphate of Copper in feed twice a day. After a week or two of above treatment withhold and give the digestive tonics recommended for "Chronic Indigestion," continuing them as case requires, or returning to above treatment after two weeks.

PIN WORMS.—These are transparent, thread-like worms, measuring about one to two inches in length, found mostly in the large intestines.

Symptoms.—Are about the same as with long round worms, except the size of worm passed.

TREATMENT.—

The same as in the previous disorder. Also inject into the rectum the following:

Copperas	1 ounce.
Water	3 quarts.

Repeat every second or third day.

TAPE WORMS.—These are white, tape-like worms, six inches to a foot in length, made up of a large number of segments. They rarely infest the horse, but are occasionally present. They take up their abode in the small intestines.

Symptoms—Are the same as those produced by other worms, except the small, flat segments of the worm are found in the droppings.

TREATMENT.—

In addition to the treatment given for the other worms, give the following, after fasting the horse for from twelve to eighteen hours:

Areca Nut (powdered)	½ ounce.
Oil Male Fern	2 drachms.
Raw Linseed Oil	½ pint.

Follow this in two or three hours with three-fourths of a pound of Epsom Salts, after which feed as usual. Repeat treatment in a week if necessary.

DISEASES OF THE LIVER AND SPLEEN

CONGESTION AND INFLAMMATION OF THE LIVER.

—These two diseases are so nearly alike, having same causes, symptoms and treatment, that they are included under one head.

Causes.—Usually from the stimulating effects of overfeeding, particularly during hot weather, with too little exercise. May also be caused by injuries over the liver; from foreign substances, or from worms in the liver; or from extension of inflammation from neighboring parts.

Symptoms.—Dullness; horse suffers from internal pain, but not of severe type; constipation and clay-colored dung-balls, scanty and high-colored urine, with general fever symptoms; when lying down is usually on left side; looks occasionally at the right side; there may be slight enlargement over the liver, and pain is evinced on pressure; horse may be lame in his off front leg; lining of eyes and mouth are yellow as in "Jaundice."

TREATMENT.—

If animal is in good condition give:

Aloes	8 drachms.
Sweet Spirits Niter	1 ounce.
Laudanum	1 "

Mix and give in 1 pint of water as a drench.

Apply a Mustard plaster well rubbed in on the under part of the belly, and clothe body well according to the season of the year. Follow drench with the following:

Fluid Extract of Belladonna	1 ounce.
Iodide of Potash	1 ounce.
Saltpeter	2 ounces.
Water to make	1 pint.

Dose: 2 ounces in ½ pint of water three or four times a day. After using for two days withhold for two days and then give again if necessary. Give a teaspoonful of Saltpeter three times each day the prescription is withheld.

Feed very sparingly on light feed, and keep bowels active by use of oil. Exercise as soon as acute symptoms are over.

YELLOWS—JAUNDICE—ICTERUS.—This is caused by the absorption of the bile into the blood. It is one of the most common diseases of the liver.

Causes.—From inflammation of the liver; from gall stones stopping passage leading from liver to the bowels.

Symptoms.—Lining membrane of mouth, nose and eyes are yellowish instead of pale pink; urine is saffron-colored; dung is a dirty gray color, and constipation generally present. In white or light-colored horses the yellow color shows in the skin; also symptoms of indigestion.

TREATMENT.—

In springtime turn out to grass, and that will usually effect a cure. If this is not feasible, or not in season, give Calomel 2 drachms, and Aloes 7 drachms, as a drench, or in the form of a ball. Then follow this treatment with the mixture as recommended for "Inflammation of the Liver;" also give a teaspoonful of Fluid Extract of Nux Vomica three times a day. Glauber Salts, in handful doses, once or twice a day for a week is said to be an effective remedy for jaundice. Keep the bowels open with soft foods and pint doses of raw Linseed Oil.

OTHER LIVER DISORDERS.—While there are other than these three disorders affecting the liver, the symptoms are so similar that diagnosis is more or less uncertain, and the treatment for all is practically the same as for the three already given.

All liver disorders need to be followed for some time with the digestive tonics.

DISEASE OF THE SPLEEN.—While the spleen is sometimes diseased, the symptoms are so obscure and so like those of other disorders that it is impossible to diagnose the troubles with any degree of certainty. Occasionally, upon postmortem, we find the organ greatly enlarged and otherwise affected; but aside from this, scientific knowledge is too meager to attempt any popular discussion.

DISEASES OF THE URINARY ORGANS

The urinary organs of the horse are not nearly as often affected with disease as most people think. The remark, "The water-works are wrong," is nearly always wrong; and yet the organs are sometimes diseased, the following disorders being the most common:

ACUTE INFLAMMATION OF THE KIDNEYS—NEPHRITIS.—

Causes.—Exposure to cold, or cold rain storms; lying on the ground when cold and damp; giving large quantities of medicines that act on the kidneys; from carrying too great weight on the back; from violent efforts in racing; or very severe strains of the back. Not a common disorder.

Symptoms.—More or less fever, pulse accelerated, temperature elevated; manifest stiffness of the back; straddling gait with the hind legs; difficulty in lying down and rising, or walking in a circle, the animal sometimes groans in the effort; arching of loins and tucking up of flanks; looking back at the abdomen, as in "Colic;" tenderness of loin when pinched, especially just beneath the bony processes six inches to one side the median line. Urinates frequently, but small quantity and of a high color, sometimes mixed with blood or even pus. Legs tend to swell from feet up, also dependent parts beneath belly and chest, and effusion of liquid may occur in chest or abdomen. In the male the alternate drawing up and relaxing of the testicles in scrotum are suggestive, and in small horses the oiled hand may be introduced through the rectum, the kidneys reached and their sensitiveness ascertained.

TREATMENT.—

Give from 1 pint to a quart of raw Linseed Oil and 4 drachms of Aloes, and keep the bowels active by giving a pint

or more of oil, and 2 to 4 ounces Epsom Salts daily; also use the following to reduce the fever:

Fluid Extract Aconite	1 drachm.
Fluid Extract Belladonna	1 ounce.
Liquor Ammonia Acetatis	4 ounces.
Water to make	1 pint.

Dose: 2 ounces, three to five times a day.

If the fever runs high, give 1 drachm of Acetanilid and an ounce of Alcohol in ½ pint of water, morning and evening. Apply to the loins a blanket wrung out of hot water; have the blanket as hot as the animal will stand; cover this first with a rubber blanket, and then with a dry, woolen blanket; this retains the heat; change every half hour; continue the applications throughout the entire day; at night apply a good stimulating liniment, or a Mustard plaster. Repeat the hot blankets each day until recovery is well advanced. Injections per rectum of about 4 quarts of water, at a temperature of 115 degrees, repeated three or four times a day are of value. If the animal desires food, give a light, easily digested, laxative diet; grass, if in season, if not, bran mashes and a little clover hay. Keep the animal warmly blanketed and groom daily, rubbing the skin thoroughly with brushes or straw. Give thin linseed gruel in place of water for drink.

CHRONIC INFLAMMATION OF THE KIDNEYS.—*Causes.*—It may result from blows, injuries, or from exposure, but is more commonly associated with faulty condition of the system—as indigestion, heart disease, lung or liver disease, imperfect blood formation or assimilation.

Symptoms.—There is stiffness, weakness, and increased tenderness in the loins, and changed secretion of the urine (increase or suppression), or the flow may be natural. Dropsy, showing in swelled legs, is a significant symptom, and if the condition takes place along the lower line of the body or in chest or abdomen, the significance is increased. Scurfy skin, lusterless hair, loss of flesh, softness of muscles, and pallor of nose and eyes are all suggestive of the disease. The finding of albumen in the urine would determine the case. To detect this boil a little urine and if

it becomes cloudy and filled with particles, when cool add a little Nitric Acid; if the cloudiness does not clear up it is albumen, if it does it is not.

TREATMENT.—

Give 1 pint of raw Linseed Oil as a drench, and keep bowels loose by repeated doses daily; give a teaspoonful of Fluid Extract of Belladonna three times a day. Give laxative food. Applications to the loins, as in "Nephritis," are good. Give the Gentian and Nux Vomica mixture recommended for "Chronic Indigestion;" omit, however, the Saltpeter and Iron mixture until after the animal is much improved, and then use it carefully.

Every attention must be given in the way of warm blanketing, a warm stall, and pure air, along with good feed.

DIABETES INSIPIDUS—PROFUSE STALING.—This consists of an excessive passing of clear watery urine, with a corresponding ardent thirst.

Causes.—Excessive and long continued use of medicines that stimulate the kidneys; acrid diuretic plants in grass or hay; an excess of roots and other watery food; feeding hay, grain or bran that has become musty. It is most common in wet season when it is difficult to properly harvest hay and grain.

Symptoms.—There is excessive thirst, and horse drinks deeply on every occasion, and passes urine at every opportunity, the discharge being pale, watery, of low density and inodorous. Emaciation and hide-bound soon follow. The eyes become dull and sunken; low spirited; sweats on slightest exertion, and can endure but little work. Horse is inclined to lick the walls and mortar to get lime, and appetite is depraved.

TREATMENT.—

First remove cause if it can be discovered, whether drugs, poisons or food, and supply only sound, well-cured hay and grain. Put a liberal supply of boiled flaxseed in the drinking water to help carry out poisons and protect irritated kidneys. Dissolve 1 ounce of Iodide of Potash in a pint of water; give 2 ounces of this solution four times a day for two days; withhold for two or

three days and give again if necessary. One-half ounce doses of the Fluid Extract of Ergot three times a day will be of value. Also give the Gentian and Nux Vomica mixture as recommended for "Chronic Indigestion." Omit the Iron and Saltpeter mixture.

INFLAMMATION OF THE BLADDER—CYSTITIS.—May be slight or severe, acute or chronic, partial or general.

Causes.—May be caused by abuse of irritating medicines, as cantharides, turpentine, copaiba, rosin, and the like; by stone or gravel in the bladder; the application of fly blisters or turpentine over too much surface; sudden exposure of a tired or perspiring horse to cold or wet; acrid plants in fodder; or extension of inflammation from a diseased vagina, or urethra to the bladder.

Symptoms.—Animal walks with a stiff, straddling gait, and makes water often, in small quantities, which is sometimes streaked with blood, and accompanied with pain, as is shown in continued straining, groaning, and perhaps in movements of the feet and tail. The penis hangs from sheath, or in mare the vulva is opened and closed as in urination. There is soreness when pressed in region of sheath or udder If due to stone in the bladder, that will be found by examination (See ANATOMY) through rectum or vagina; the bladder will also be found to be sensitive. The temperature will be elevated and the pulse accelerated.

TREATMENT.—

First, if possible, remove the cause, whether in food or medicine, the removal of Spanish Fly or other blistering agents from the skin. If the urine has been retained and decomposed, it must be completely evacuated through a clean catheter, and bladder washed out with a solution of ½ ounce of Boracic Acid in a quart of water. This must be repeated daily until the urine no longer decomposes. Diet must be light—as bran mashes, roots, fresh cut grass—and the drink impregnated with Linseed tea. Inject into the bladder a warm Alum solution (Alum ½ ounce, water at 115 degrees, one quart); repeat three or four times a day. Make hot applications to the loins, as in "Nephritis," and apply

Mustard paste to the back part of the belly, just in front of the udder in the mare, in front and at the sides of the sheath in the horse. Internally, use same treatment as for "Nephritis."

To inject into the bladder, pass the catheter, attach a piece of rubber tubing to the outer end, put a small funnel in the other end of the tube, elevate the funnel and pour the solution into it; it will flow and fill the bladder, and by lowering the tube it will run out. To pass the catheter, see OPERATIONS, page 347. If Calculi are present, remove them. See next disease.

STONES IN THE BLADDER—CALCULI.—Stones are also found in the kidneys, or in the tubes leading down to the bladder from the kidneys, but they are generally found in the bladder. They are masses of lime of varying sizes.

Causes.—From kinds of food eaten, and from the use of drinking water containing a great percentage of lime.

Symptoms.—Horse is uneasy and has colic pains; will be in more pain just after passing water; in some cases where there are a number of stones, the horse after making water, will pass blood, and for a few times after this he may pass water as usual, and then will pass blood again. In urinating, the flow will sometimes stop suddenly, and after a moment commence again. Examination by hand in the rectum will determine the existence of the stones or stone. In the mare they can sometimes be reached by the finger through the urethra. (See ANATOMY).

TREATMENT.—

Give the animal soft water instead of hard water. Give plenty of soft feed with boiled Linseed in it to keep the bowels free, and give diluted Hydrochloric Acid in 1 drachm doses, mixing it with 1 pint water and giving it as a drench three times daily. The action of this acid is to dissolve stones. Continue the use until animal is better. In severe cases resort must be had to an operation, called lithotomy—removing the stones with forceps. The operation would require a veterinarian.

EVERSION OF THE BLADDER.—This is met with only in mares, and is the result of long-continued labor, or from straining in inflammation of the bladder. Is a very rare accident.

Symptoms.—The bladder will be seen protruding from the lower part of the vulva, a round, red, fleshy-looking substance, and the entrance of the tubes from the kidneys will be plainly seen near the neck, with urine dripping from them.

TREATMENT.—

Put 1 ounce of Laudanum in 1 pint of water and gently bathe the bladder with it; then press gently and continuously until it is returned to its place. Great care must be taken not to push the fingers through the walls of the bladder, especially if it has been out sometime and is swollen. After it is returned, if animal is in pain, give 1 ounce doses of Laudanum or ½ ounce doses of Chloral Hydrate every two hours until animal stops straining and seems relieved. If inclined to come out again after being returned, put on a compress to hold it in. If possible a veterinarian should be secured to treat the case.

The after-treatment would be as in "Inflammation of the Bladder."

SPASM OF THE NECK OF THE BLADDER.—This affection consists in spasmodic closure of the outlet of the bladder by contraction of the muscular fibres. It is most frequent in the horse, but is not uncommon in the mare.

Causes.—Hard and continuous driving without chance to make water; cold rain-storms; draughts of cold air when perspiring and fatigued; administrations of Spanish fly; application of fly blisters extensively; abuse of diuretics; acrid plants in fodder; and calculi in the bladder. Spasms of the bowels are sometimes attended with spasms of the bladder.

Symptoms.—Frequent stretching and straining to urinate, with no result, or but a slight dribbling only, and this attended by pain and groaning. On resuming his normal position pains continue, and he paws, shakes his tail, kicks at the abdomen with hind feet, looks back to the flank, lies down and rises, arches back, and tries again to pass water. If oiled hand is introduced into rectum the greatly extended bladder may be felt beneath it, and horse will often flinch when it is handled.

TREATMENT.—

Begin by taking horse out of the harness; if this fails, spread clean litter beneath the belly or turn patient out where there is straw. Apply hot blankets to loins, as in "Nephritis." Give from one to two teaspoonfuls of Fluid Extract of Belladonna by the mouth, or inject the same, in two ounces of water, into the urethra, using catheter, as in "Inflammation of the Bladder." In the mare, the neck of the bladder is easily dilated by inserting the oiled finger into the urethra (see ANATOMY). In the horse, the oiled hand may be introduced into the rectum, and gentle pressure given from before backward on the anterior or blind end of the bladder. If above fails then pass the catheter (see OPERATIONS). If the instrument is at hand it is best to pass it the first thing and relieve the animal at once.

PARALYSIS OF THE BLADDER.—

Causes.—From weakened state of the system; from exposure to cold; or from long continued distension of the bladder from urine being held, as in rheumatism, lock-jaw, paralysis, or diseases that keep the animal in a lying position.

Symptoms.—There is a constant dribbling when the neck is involved, the liquid running down the inside of the thighs and scalding the skin. When neck is not involved, the urine is retained until the bladder is greatly over-distended, when it may be expelled by the active contraction of the walls of the abdomen; but this never empties the bladder entirely, and the oiled hand through the rectum may feel the soft, flabby organ still half full of urine. This retained urine is liable to decompose and the disease result finally in the worst form of inflammation of the bladder.

TREATMENT.—

Lies in the successful treatment of the disease which it accompanies. The urine must be drawn off four or five times a day with a catheter to prevent over-distension of the bladder. If persistent after the recovery of disease it accompanies, apply a thin paste of Mustard and water over the back part of the belly in front of the udder, and cover with cloths until hair stands erect. In the male apply the remedy on each side of the sheath. Give

three or four times a day a teaspoonful of Fluid Extract of Nux Vomica, or use the tonics as recommended under "Chronic Indigestion," omitting the Iron and Saltpeter mixture until after the other has been used for a week or two and the water has commenced to pass normally.

ISCHURIA.—This is where there is no passing of water on account of it not being excreted by the kidneys.

Cause.—From kidneys not acting properly.

Symptoms.—There is no passing of water. The non-passing of water may arise from diseases of bladder, obstructions, etc., but in such cases the bladder is found, upon examination per rectum, to be full; with this disorder it is found to be empty.

TREATMENT.—

If from kidneys not acting properly, give 1 to 2 ounces of Sweet Spirits of Niter and a teaspoonful Fluid Extract Nux Vomica three times daily, until horse makes water, then follow this with the digestive tonics as prescribed under "Chronic Indigestion."

DRIBBLING OF THE URINE—ENURESIS.—In this case the urine dribbles away involuntarily.

Causes.—May come from weakness of the neck of the bladder; from injury to neck by the catheter; from paralysis of the bladder, or from stone or calculi.

TREATMENT.—

If from paralysis, or weakness of the neck of the bladder, apply the Mustard paste as recommended in "Paralysis of the Bladder," and give a teaspoonful of Fluid Extract Nux Vomica, three times a day. If from injury from catheter, give the same and also injections as in "Inflammation of the Bladder." A teaspoonful of Saltpeter, two or three times a day, may also be given. Cold water dashed onto the loins will sometimes help.

BLOODY URINE—HAEMATURIA.—

Causes.—Usually from injuries, as sprains and fractures of the loins; lacerations of the sub-lumbar muscles; irritations

caused by stone in the kidneys, ureters, bladder, or urethra. May also occur in acute congestion or inflammation of the kidneys, with tumors in their substance, or with diseased growth in the bladder. Acrid diuretic plants may also be a cause.

Symptoms.—The presence of blood in the urine, giving it a reddish tinge. If blood is from the kidneys, it is more likely to be uniformly diffused through the urine; if from the bladder, small clots are more likely to be present.

TREATMENT.—

If due to injury to the loins, treat as for strains, If Calculi cause, remove them. (See "Calculi.") Irritants in food must be avoided. Give mucilaginous drinks, as Linseed tea, freely. Internally, give the following.

Fluid Extract Belladonna.....	1 drachm
Fluid Extract Ergot.....	½ ounce.
Water to make.....	1 pint.

Give as one dose, and repeat four times a day for two or three days, if conditions require; alternate with this ½ ounce Tincture of Iron, in ½ pint of water.

Hot blankets to the loins would be valuable in some cases.

STRICTURE OF THE URETHRA.—This is a permanent narrowing of the urethra at a given point.

Causes.—Irritating ingredients in the urine; by strong injections used in gleet; or by the healing of ulcers in neglected gleet.

Symptoms.—The urine is passed in a very fine stream with straining, pain and groaning, and by frequent painful erections.

TREATMENT.—

Consists of mechanical dilitation, with catheters just large enough to pass with gentle force. Insert once a day, increasing the size as passage will admit them. The catheter should be kept perfectly clean and washed in a solution of Borax and water and well oiled before it is introduced. A teaspoonful of Fluid Extract of Belladonna in an ounce or two of water injected through the catheter into the urethra may help in dilating. To inject, see "Inflammation of Bladder."

OBSTRUCTION OF URETHRA WITH A CALCULUS.—Occasionally the urethra is obstructed by a limy deposit which forms either in the urethra or in the bladder and then flows down into the urethra and obstructs it.

Symptoms.—The symptoms will be the same as those for "Spasm of the Neck of the Bladder." The urine will be retained.

TREATMENT.—

Medicinal treatment will fail; the catheter must be passed and the deposit pushed back into the bladder and then treated as described under "Calculi." If the obstruction cannot be dislodged with the catheter, it must be cut down into and removed. This would require a veterinarian.

AZOTURIA.—The exact nature of this disease is not well understood, and while it is not a disease of the urinary organs, it is described in this connection, as these organs are affected by the disease to a greater or less extent. It always occurs with overfed and under-exercised horses.

Causes.—From allowing the horse to stand in the stable and feeding too well. Horses that are being liberally fed upon grain should be out for exercise at least every other day. If for any reason the horse cannot get out for exercise, cut down on the grain ration.

Symptoms.—The disease always develops during exercise. The horse is taken out for work after a period of rest, with high feeding. He starts out feeling extra active and playful, but after going from a few rods to three or four miles, the driver notices something wrong; the horse slacks up, commences to sweat profusely, breathes heavily, shows lameness or irregularity in action of hind limbs, seems stiff, the ankles throw forward, and back is apt to be arched; if not stopped, the weakness gets worse, the horse reels and goes down, and is unable to get up with the hind limbs; may rise up with the front limbs. The hind limbs are paralyzed. The muscles of the loins are swollen and hard. If he goes down, he shows great nervousness; if stopped before he goes down, he braces himself, trembles, and continues to sweat

for some time; the urine, when passed, or if drawn, is of a dark, coffee color, and apt to be thick. If down, he is unable to pass the urine.

TREATMENT.—

As soon as the first symptoms appear, stop the animal, unhitch and blanket warmly right where he is; do not try to get to a barn, unless the weather makes it absolutely necessary, in which case get to the nearest. If stopped at once, the attack will probably be light, but a little extra exercise may turn the scales. Frequently the driver goes a little further, to see what develops, and this often changes a mild, into a fatal case. Get a veterinarian to treat the case, if possible. If not, give the following: A teaspoonful of the Fluid Extract of Belladonna and ½ ounce of Bromide of Potash, in ½ pint of water, repeat in two or three hours, and afterwards repeat every four or five hours; also give 1 drachm doses of Iodide of Potash, in ½ pint of water, repeat four times the first day, afterwards three times a day for two days; also give twice a day, 1 ounce of Sweet Spirits of Niter. Aside from these, the horse should have a purgative; give 1 ounce of Aloes in form of a pill, or in a pint of thin Linseed gruel; ¾ pound of Epsom Salts can be substituted for the Aloes; if the bowels do not move freely in twenty-four hours, give a pint of Oil, and repeat every six or eight hours until they do. Aside from this internal treatment, apply hot blankets to the loins as in "Nephritis." If the animal is down, he must be kept bolstered up on his chest, and rolled over five or six times a day; if down, the urine must be drawn with a catheter, four or five times a day. (See OPERATIONS.) If for any reason it is not best to use hot blankets, hot bags of salt may be substituted. If horse is treated where attacked, after six to ten hours he can probably be very slowly worked to the nearest barn, where he should be kept three or four days. If he goes down on the street, remove to a barn on a large stone-boat.

The disease can always be prevented by exercising, at least every other day, horses which are being liberally fed. Allow the animal to become thoroughly convalescent before exercising again, and begin by exercising gradually.

DISEASES OF THE GENITAL ORGANS OF THE HORSE

INFLAMMATION OF THE TESTICLES—ORCHITIS.—When in vigorous health and on stimulating food, stallions are subject to congestion of the testicles, which become swollen, hot and tender, but without any active inflammation. The reduction of the grain in the feed, and by giving ½ pound of Epsom Salts, repeating in two or three days, also a teaspoonful of Saltpeter three times a day and bathing affected parts with hot water, or Alum water—Alum 1 ounce, water 1 pint—will usually restore him. From frequent copulation, heavy grain feeding, hot weather and lack of exercise, if not relieved, congestion may run into inflammation.

Causes.—Besides as noted, this may arise from blows and penetrating wounds, implicating testicles; abrasions of the scrotum by a chain or rope passing inside of thigh; from abrasion by rubbing against the inside of thighs in trotting stallions; from sympathetic disturbance in diseases of the kidneys, bladder, or urethra.

Symptoms.—Apart from wounds of the parts, there is a swelling, heat, and tenderness of the testicles, straddling of the hind legs, alike in standing or walking; stiffness and dragging of the hind limbs or limb on affected side, arching of loins, abdominal pain, as shown by looking back at flanks; more or less fever, rise of temperature, quicker pulse and breathing, lack of appetite and dullness. Generally symptoms abate about second or third day, and if it lasts longer abscesses are apt to form. Improvement may go on slowly or malady subside into a subacute or chronic form.

TREATMENT.—

Give perfect rest and quiet, and administer a purgative of ¾ to 1 pound of Epsom Salts or, instead, an ounce of Aloes. Apply an astringent lotion of:

Acetate of Lead	1 ounce,
Fluid Extract of Belladonna	1 "
Water	1 quart,

to the affected parts with soft rags or cotton wool, and keep in place with a bandage. Foment freely with hot water. When abscess threatens apply warm poultices of half Linseed meal and half bran to favor formation of pus, and when ready the knife must be employed to give free escape of pus. The resulting cavity may be injected with a weak Carbolic lotion:

Carbolic Acid	2 drachms.
Water	1 pint.

This will keep wound clean and favor healing.

Also give internally the following.

Fluid Extract of Belladonna	1 ounce.
Fluid Extract of Aconite	1 drachm.
Fluid Extract of Colchicum Seed	½ ouuce.
Saltpeter	2 ounces.
Water to make	1 pint.

Shake. *Dose:* Two ounces four times a day.

Feed very sparingly on laxative diet.

DROPSY OF THE SCROTUM, OR BAG-HYDROCELE.—The scrotum is the bag or pouch that contains the testicles.

Causes.—This may be an accompaniment to dropsy of the belly, the cavity of which is continuous with that of the scrotum in the horse. It may result from local disease of the testicles, the spermatic cord, or the walls of the pouch.

Symptoms.—There is enlargement of the scrotum, with a fluctuation under the fingers; the testicle will be recognized as floating in water. By pressure the liquid is forced in a slow stream, and with a perceptible thrill, into the abdomen. Sometimes the cord or scrotum is thickened, and "pits" on pressure.

TREATMENT.—

Give a laxative in the form of one-half pound of Epsom Salts, or 6 drachms of Aloes. Also give the following:

Fluid Extract of Colchicum Seed	6 drachms.
Saltpeter	2 ounces.
Iodide of Potash	1 ounce.
Water to make	1 pint.

Dose: 2 ounces three times a day; give three days, withhold a day or two, and give again.

If there is any inflammation of testicles or cord, give local treatment, as in previous disorder. Painting the scrotum with Tincture of Iodine once a day is also good. One-half ounce doses of Tincture of Iron given three times a day in ½ pint of water, alternating with the previous mixture, will be helpful. If this line of treatment fails it will be necessary to draw off the water with a small trocar and canula, repeating if the scrotum fills up again, Feed nourishing but laxative diet.

GONORRHEA OR GLEET.—

Causes.—This is an inflammation of the urethra from irritating substances in the urine; excessive work in the stud; masturbation; connection with a newly delivered mare; or with one that has an irritating discharge from the womb; injury to penis; or from stone or gravel. Mostly confined to stallions.

Symptoms.—The urine will be passed in jets, with frequent interruptions and manifestations of pain; there is swelling and soreness of sheath; later, there will be more or less discharge of pus which will be seen around the head of the penis. There is tendency to erection of penis, and in cases contracted from the mare, the outer surface of organ will show more or less of sores and ulcers. Stallion, in such cases, will refuse to mount, or in case he does, will not complete act of coition. If entrance is effected, mares are liable to infection.

TREATMENT.—

Give in early stages 6 drachms of Aloes and apply cloths wrung out in hot water to sheath and penis. If infection is suspected, inject into the urethra, through the penis, twice daily, a solution made as follows:

Boracic Acid	1 drachm.
Fluid Extract of Belladonna	1 ounce.
Water (tepid)	1 quart.

Mix.

Inject by passing catheter a little distance and injecting through it as in "Inflammation of the Bladder." Where a discharge shows later in the disease, inject:

Nitrate of Silver	30 grains.
Water	1 quart.

And the same may be applied to the surface of penis and inside of sheath. One drachm doses of Copaiba may be given once daily after the discharge has appeared.

One ounce doses of Sweet Spirits of Niter morning and night may also be given.

Stallions suffering from this disease should be withheld from service, as also should mares with leucorrhea.

Feed a laxative diet and give regular exercise.

PHIMOSIS, AND PARAPHIMOSIS.—These are swollen or otherwise diseased conditions of the penis. In the first, the penis is swollen and confined within the sheath, and in the second, the penis swollen or otherwise affected without the sheath, and cannot be drawn back.

Causes.—From castration, or from injury by blows or kicks; from rough handling, or from too much service.

TREATMENT.—

When the penis is swollen and confined, bathe the sheath in cold water, enlarge, if necessary, the external portion of sheath so as to liberate the penis, and then bathe penis with cold water, and apply a lotion made of:

Sugar of Lead..... ½ ounce.
Water..... 1 pint.
Mix, and apply to affected parts three times daily.

When penis protrudes and is swollen outside of sheath, bathe with cold water and apply the Lead lotion as in "Phimosis," and support the penis by a bandage passed around the loins. This should not be omitted, as weight of swollen organ is sufficient alone to keep up irritation and inflammation. As a last resort, the rim of the sheath may be slit up a little and penis manipulated and pushed back, treating wound with lotion as before.

Paralysis of the penis will also cause it to hang from the sheath; in this case it is not swollen, but hangs in a flabby condition, otherwise looking normal. Treatment in this case is to give, internally, a teaspoonful Fluid Extract of Nux Vomica three or four times a day; give exercise; bathe penis with hot water.

Growths upon the penis may also prevent its being withdrawn. These would need to be treated according to their nature. If conditions cannot be overcome, the penis can be amputated. The operation would require a veterinarian.

FOUL SHEATH.—As a general thing the sheath of a horse needs no cleaning. The glands ordinarily secrete a fluid to lubricate the parts in the proper amount, but at times there is a larger secretion, or a diseased secretion, and it accumulates as a gummy, black substance in the sheath, and irritates the parts, causing "Foul Sheath."

TREATMENT.—

Wash out carefully with a little soap and warm, soft water, being careful not to use any violence in drawing down the yard, and particularly be careful not to scratch parts with the finger nails, using a soft sponge or cloth. After cleaning, dry by pressing gently with a dry cloth and apply melted vaseline.

SWELLING OF THE SHEATH.—

Causes.—This may arise from a bad condition of the blood; from disordered kidneys; from a foul sheath, following castration, and in disease of the kidneys. If sheath is foul, treat as previously described. Give the horse a physic of 6 to 8 drachms of Aloes to clear the bowels, and when this has operated, give the following powders: Equal parts, by weight, of Saltpeter and Sulphur; mix thoroughly and give a tablespoonful three times daily in the feed. Give a little exercise each day and the swelling will soon go down. If after castration, treat as described under that operation.

GROWTHS ON END OF PENIS.—These are of various kinds and ofttimes prove very troublesome and painful when animal is urinating.

Causes.—Are varied. Sometimes from neglect in treating a slight injury, the sore will throw out a growth. At other times the growths are of fungoid nature.

TREATMENT.—

If not very large, wash off with warm water and soap, then touch the effected part with a stick of lunar caustic, which will burn it. When scab falls off, wash and burn again, repeating until growth is removed. Dress every day with a carbolic lotion. Bad cases require treatment by a veterinarian.

WARTS AROUND THE SHEATH.—These are often seen on the sheath, and in some cases may be seized between the thumb and finger and twisted off. Or they may be removed by tying a cord around them tightly, which will stop circulation, and they will drop off. When it can be done this is probably the best manner of removal. Still another way of removing it is to cut them off with a knife or scissors, and touch the wound with a stick of lunar caustic.

MASTURBATION.—This is a bad habit of abusing nature that some stallions get into.

Causes.—From weakness in consequence of having too much work in the stud, or from superfluous passion attending want of work and being fed too highly.

TREATMENT.

If from the weakness from overwork, reduce work, and give the digestive tonics. Give walking exercise daily. If from lack of work, give a purgative of 6 to 8 drachms of Aloes, reduce the grain and increase exercise, and give a teaspoonful of Saltpeter two or three times a day. Sometimes the only remedy is a mechanical one—the fixing of a net under the penis in such a way as to prevent extension of the organ. It is well to use this in connection with the other treatment.

DISEASES OF THE GENITAL ORGANS OF THE MARE

INFLAMMATION OF THE OVARIES.—This disease, though rare, is occasionally met with in the mare.

Causes.—It usually occurs at the time of heat, and passes away when that is over; it aggravates the passions excited at that time.

Symptoms.—There is a slight fever, and soreness on pressure in the region of the loins. The periods of heat are irregular; at times almost continuous.

TREATMENT.—

Give a teaspoonful of Saltpeter and a teaspoonful of Fluid Extract of Belladonna in a bran mash three times a day for a few days. Feed laxative food.

ENLARGEMENT OF THE OVARIES.—This is another disease that is met with in connection with the ovaries.

Causes.—Results from inflammation sometimes obscure.

Symptoms.—Mare is more or less irritable; falls off in condition; if put to horse does not get with foal; is more or less continuously in season. Symptoms not diagnostic. Examination per rectum might reveal condition in some cases.

TREATMENT.—

If in good condition give her a physic—Aloes 8 drachms, in form of a pill or in thin gruel. Give a teaspoonful of Saltpeter three times a day for a week; withhold a week and give again. Dissolve an ounce of Iodide of Potash in a pint of water; give 1 ounce of the solution three times a day; give for a week, withhold a week and give again; alternate with the Saltpeter. Where possible, an examination by a veterinarian would be advisable.

WHITES—LEUCORRHEA.—This is a catarrh of the vagina, or the womb, or of both.

Causes.—Originally, by a slight attack of inflammation, a discharge from the irritated surfaces is set up and soon becomes chronic. It often follows foaling, in which the parts have been torn or injured. It invariably follows retention of the afterbirth. Also found in old mares that are out of condition, and have ceased to breed.

Symptoms.—There is a discharge of whitish, slimy substance from the vulva, of a disagreeable odor; in fact, when following retention of the afterbirth, it is purulent and very offensive. Animal loses flesh; the coat becomes rough, coarse and staring, and the milk dries up, or nearly so. Where the womb is involved, the discharge is thrown off after urination, or when pulling severely, oftentimes in large quantities.

TREATMENT.—

Wash out the womb and vagina, using a soft, rubber tube with a funnel attached, through which pass warm water at a temperature of 115 degrees, until it comes away clear. To make sure the treatment reaches the womb, oil the hand and tube, introduce them into the vagina, and insert the tube through the mouth of the womb. Elevate the funnel and pour the water into it. Close the lips of the vulva by clasping them, thus filling the organs full, then let it flush out. After flushing out thoroughly with the water, pour in the following lotion:

Sugar of Lead..	3 drachms
Warm water.....	1 quart.

Use enough to fill organs full, holding the vulva to retain it a few minutes. Carbolic Acid, 2 teaspoonfuls to a quart of water, can be used part of the time in place of the Lead solution. Alum or Copperas is sometimes used in place of the Sugar of Lead. Treat once a day at first, afterwards once in two or three days, as case requires.

To tone up the animal, use tonics as for "Chronic Indigestion."

BARRENNESS IN THE MARE.—In this case the mare does not breed.

Causes.—From enlarged or diseased ovaries; from contraction or closure of the mouth of the womb; from neck of the womb being turned to one side; diseased condition of the womb; old age.

TREATMENT.—

Examine the neck of the womb by passing the hand, oiled, into the vagina until the mouth of the womb is reached, and, if you find it contracted, or closed, open it by working your fingers gently around in it until it dilates or opens. If a little hard to dilate, saturate a small piece of soft sponge with Fluid Extract of Belladonna, tie a string to it and carry the sponge into the vagina and press into the mouth of the womb as far as possible. Leave it there an hour and on removing it you will probably find the neck relaxed and easily opened. After the neck is opened, put the mare to the horse, and she will most likely get with foal. If the neck of the womb is twisted to one side, try and straighten it with your hand, and immediately have her put to the horse. If the ovaries are diseased, treat as previously described, or call a veterinarian. Sometimes after breeding to one horse a number of times, and she does not get with foal, a change of horse may bring success. If ordinary copulation fails, inject the semen directly into the womb with a syringe.

A run at grass, along with tonic preparations, as those recommended for "Chronic Indigestion," may successfully overcome barrenness.

If mare is fleshy, deplete her. If in poor condition, tone her up. If womb is diseased, treat accordingly.

HYSTERIA.—This is a peculiar and rather rare nervous affection accompanying heat, and manifested principally by the voluntary muscles.

Symptoms.—It occurs at the time of heat; the jaws champ; the teeth are ground; the muscles tremble; the legs and feet are liable to paw, strike or kick spasmodically; in short the mare acts in a generally delirious manner, at times becoming more or less vicious.

TREATMENT.—

Give a quart of Linseed Oil to act as a purgative and follow with:

Fluid Extract of Belladonna..... 1 teaspoonful.

Or:

Sulphate of Morphia ..... 4 grains.
Water..... 1 ounce.

Give as one dose; repeat every three to six hours until the unpleasant symptoms have disappeared.

The disease is generally due to some disease or abnormal condition of the ovaries. It is often necessary to have these organs removed in order to overcome the disorder.

FOALING (PARTURITION) AND ATTENDANT DISEASES

Gestation, or the period of carrying the young, continues, on the average, eleven months or forty-four weeks, but may be extended or shortened in some instances a month either way. The covering around the foal, or fœtus, is called the cleaning, placenta, fetal envelopes, or after-birth, and is attached to the inside of the womb, to the little processes called papillæ; connecting the foal and the after-birth is the navel-string, or umbilical cord. This is made up of blood vessels, which convey the fetal blood down to the fetal envelopes, where the nourishment is received from the mother's blood, and the impurities given up to her blood. The air element—oxygen—is also received here, so we might say that the fœtus breathes through the cord, and for this reason if it is broken, the fœtus soon dies. Between the foal and after-birth is a fluid, the use of which is to protect the foal from injury from the motion of the mare.

HOW TO TELL WHEN A MARE IS WITH FOAL.—The mare becomes gentler in disposition, and there is an increase of fat; the belly gradually becomes distended, and at the

end of the sixth or seventh month, after the mare has taken a drink of cold water, there is movement on the part of foal. The signs are more noticeable on the left than on the right side. Another way is to pass the oiled hand into the vagina and find if the neck of the womb is closed and sealed. This must be very carefully done, or abortion may be produced. The foal may be felt at the same time. By examination per rectum, it can also be told whether a fœtus is present or not. During the time of gestation, it is not the rule for the mare to get in heat every three weeks, but this is not an infallible sign, as occasionally a mare will take the horse when with foal; but ordinarily, when a mare ceases to come in heat after being bred, it is a good indication that she has conceived. They will frequently pass the first period, but come in heat at the second, and so they should be closely watched for six or even nine weeks after being bred, for indications of being in heat.

HOW TO USE A MARE WITH FOAL.—The best treatment for a mare that is with foal is to give her regular farm work up to the very time of foaling. After the abdomen commences to noticably enlarge, do not give rapid road work. Never let her pull too heavy, especially toward the last, or slip or strain herself, or back up too suddenly, as these have been the causes of mares losing their foals. Slipping is especially dangerous. In the absence of moderate work the mare should be kept in a lot where she can exercise at will. During the winter she should be out a portion of each day for exercise. The food should be liberal but not too fattening, such as oats, bran, and good clover hay. In the spring, turn out to pasture at night. Water should not be too cold, and given rather often. Constipation should be corrected by bran mashes, carrots, etc., and if medicine is needed give a dose of oil. A few carrots or other roots fed during the winter are excellent.

After the mare foals, turn her out with her colt for at least ten days before putting her into work again.

SIGNS OF IMMEDIATE FOALING.—As the period of foaling approaches the swelling of the udder bespeaks the

coming event. For a few days before, a liquid comes from the teats, and in about twenty-four hours forms as a white wax around the orifices. The mare should now be watched closely until after the act takes place. The vulva enlarges, and there is escape of glairy mucus. The belly droops, the flanks fall in, aud the loins are depressed. Finally mare becomes uneasy, stops feeding, looks anxious, whisks her tail, and may lie down and rise again. In many cases this is not repeated, mare remaining down. Violent contraction of the abdominal muscles ensue; after a few pains the water bag appears and bursts, followed by the fore feet of the foal, with the nose between the knees, and, by a few more efforts the fœtus is expelled. This is sometimes accomplished standing. The whole act may not occupy more than ten to fifteen minutes, and should never be prolonged to any great length of time if everything is normal.

When the act takes place the mare should be by herself in a large, roomy place.

THE NAVEL-STRING—UMBILICAL CORD.—The navel-string which connects the foal to the membranes is ruptured when the foal falls to the ground, or when the mare rises if she has been down, and the membranes are expelled a few minutes later. If the cord does not break immediately after foaling, take a piece of cord and tie it one inch from the belly, then cut off the navel-string an inch below where it is tied and leave the string on until it drops off; this will prevent bleeding. Use Carbolic Acid solution on string and also on the cord.

NATURAL WAY FOR THE FOAL TO COME.—When there is a single foal, the usual position is with the fore feet first, the nose between the knees, and with the front of the hoofs and the knees and the forehead directed upward toward the anus, tail, and croup; or, in other words, the foal lies on its belly. When there is a twin birth, the second foal usually comes with its hind feet first, and the backs of the legs, the points of the hocks, and the tail and croup are turned upward toward the anus and tail of the mare. This position also occurs with a single fœtus. In both these ways, the curvature of the body corresponds

to that of the passages. Any presentation different from these may be said to be abnormal, and are treated under the next heading. The first is called a front, the second a rear presentation.

CAUTIONS IN ASSISTING WITH PARTURITION.—Certain precautions are very important in assisting at parturition; first, be gentle; also have everything clean—hand, arm, ropes and instruments; first, wash in soap and water and then oil freely with carbolized lard or oil (lard or oil ⅓ pint, Carbolic Acid 1 teaspoonful) thoroughly mixed; introduce nothing into the womb until it has been thoroughly oiled. Cut finger nails short and have dirt cleaned from beneath them. In assisting, pull steadily and gently, only when the mother throes. In repelling, or pushing foetus back into the womb, repel only when throes are not on, holding what you gain when she again strains. In entering the hand for an examination, make it cone-shaped, by placing the thumb and two outer fingers toward the center. Do not be in too much of a hurry, gentleness is more important than speed. In making an examination, the water sack should be broken and the hand put inside, directly against the fœtus. When an examination is made and the fœtus is found to be in a wrong position, examine thoroughly and determine just how it lies, then outline a plan for putting it into either a front or a rear presentation, and proceed at once to carry out the plan. If the presentation is going to be quite difficult to correct, and the mare is straining hard, something should be given to stop it to a great extent. The best drug for this is Chloral Hydrate, dose, from ½ to 1 ounce in ½ pint of water, or 2 ounces Laudanum may be used, or a teaspoonful of Fluid Extract of Belladonna. Any of them may be repeated in one-half hour if necessary, and again in an hour. Have the animal stand while the correction is being made.

If after a mare has been laboring for one-half hour, there seems to be no progress, an examination should be made to determine the trouble. The examination can do no harm if the foregoing instructions are followed, and if anything is wrong the sooner it is determined the easier it is to correct it. Sometimes a very slight mal-presentation, which can be corrected in two or

three minutes, will stop the passage of the fœtus. Why allow the mother to suffer for an hour or two? The examination causes no extra pain and may be the means of relieving so much. If a bad presentation is found and a veterinarian is to be called, which is always best, if one can be had, quiet the mare with the drugs, and if the labor becomes severe, place the hand in the womb and hold the fœtus from coming back any farther. After the womb has contracted so as to crowd the fœtus well back into the arch, it is very hard to make a correction, and by preventing this, the veterinarian has a much better chance when he arrives.

The symptoms of mal-presentations and other difficulties to parturition is simply the straining without progress, and an examination determines the exact trouble.

DIFFICULTIES MET WITH IN FOALING—MALPRESENTATION.—With natural presentation, difficult parturition is a rare occurrence. Sometimes, however, labor pains come on and the mare wants to foal, but the mouth of the womb remains closed. In such a case, smear hand and arm with Carbolized Lard, enter hand with thumb and fingers together, cone-shaped, into the passage, and in some cases you can open the mouth of the womb very easily with your fingers. If it will not open easily, smear the neck with Fluid Extract Belladonna and lard, equal parts, and after a little while it will probably easily open.

If the front legs and head appear, and the labor does not bring the foal any farther, use gentle force, pulling on legs and head, when the mother strains, holding what you get between throes. Never pull upon any presented part until you are sure the presentation is correct. Sometimes when presentation is correct, a case of dropsy of the belly—where the foal's belly is swollen with water—will prevent the fœtus passing; in such a case push fœtus back, pass in a knife, guarded by the hand to not injure the mare, and make a small incision in the foal's belly to let out the water, and then start head and legs again, and she will probably soon foal, if gently assisted.

In case of "water in the head" (Hydrocephalus), the feet and point of nose will start, but advancement ceases, and an

examination reveals the difficulty; the top of the head is much enlarged and soft; puncture the head with a trocar or knife, let out the water and press in the thin, bony walls. Now give the mare a little help when she labors, and the foal will come.

A foal may come with head and only one front leg extended, and the mare cannot deliver. In such a case, push foal gently back and bring the other leg forward, and mare will foal probably without more trouble. Sometimes the front legs come with the head, which is turned back, either to one side, upon the back, or down between the front legs. Push the foal back; take a piece of rope four or five feet long, make a noose and slip it over foal's nose. Have assistant pull on the rope gently, while you help to straighten the neck and head, placing them between the legs; follow with a little gentle pulling, if necessary, and the foal will come. Sometimes head will appear, but both front legs are turned back. Push foal well back, catch front legs and bring them forward, one at a time, then pull gently on the legs to complete delivery. All four legs sometimes come together and head is turned back. In such a case it is best to push the front legs back into the womb as far as you can with hand and arm, and bring foal out backward, pulling gently on hind legs.

If the presentation is backward, and the hind legs come first, the delivery will generally be normal, although not as easy as front presentation. If, however, the foal is coming backward, and the legs do not appear, and nothing but rump, tail, and hips, are felt, the hind legs being turned in under; shove the hind end of the foal upwards and towards the front of the womb, then slip the hand down and get hold of the foot of a hind leg and lift upward and backward until you can bring the leg out into the passage; repeat the operation with the other leg, and the foal will come away backward. It is more difficult to correct rear, than front presentations.

In the case of twin foals, if there is difficulty, examine the case thoroughly, and whichever foal is nearest the outlet, deliver first, first making sure that the legs which are presented, and that you are pulling on, are the legs of the same foal. The second foal comes very easily.

Sometimes the foal will be lying partially upon its side and the feet will not come out straight, but strike the side of the passage and prevent delivery. In such a case straighten by rolling the fœtus down onto its belly.

Each mal-presentation must be carefully studied and good judgment used as to the best way to correct, remembering that gentleness and cleanliness are very important.

Deformities or freaks of nature hardly ever occur twice alike, so no specific instructions as to assisting delivery can be given. A thorough examination must be made, and good judgment used as to the best way of proceeding, acting on plans given in the different positions.

In all cases where it is necessary to push the foal back into the womb, the hind parts should be raised, by boards, by bedding, or by head of mare being turned down hill, as this will tend to make the foal go forwards. It is always best to use the hands, and pieces of fine rope, avoiding as far as possible all knives, hooks and harsh methods. Sometimes, when it is impossible to correct a presentation, it is necessary to cut up the fœtus within the womb. A veterinarian should always be secured for the operation.

Blunt or even sharp hooks can sometimes be used to advantage in correcting a presentation, but due caution must be used not to injure the mother, and they should always be attached to a rope to avoid dropping them.

If a mare is not delivered of her foal in a half hour, or such a matter, after the labor commences, there is something wrong, for when everything is normal the contractions of the womb and abdominal walls are so powerful that she foals in a few minutes. It is best, after waiting as above, to make an examination, and if anything is wrong to right it at once, for it is easier to do it immediately than after the mare has been sick for a couple hours. By so doing the mare's life is often saved as well as that of the foal.

CLEANING—PLACENTA, OR AFTER-BIRTH.—Sometimes the mare will not clean properly, and part of the

membranes remain attached to inside of the womb, and it will be left hanging out behind. In such a case try the following:

Raw Linseed Oil.....	½ pint.
Sweet Spirits of Niter.....	1 ounce.
Fluid Extract of Belladonna	1 teaspoonful.

Mix and give as a drench.

Put cloths, wrung out in hot water, or a peck of hot salt in a bag on the loins and cover to keep in heat. If this does not cause it to come away in the course of twenty-four hours it will have to be removed. Have mare held by the head, with one front leg held up so she cannot kick, and the tail held to one side. Oil the hand and arm with the Carbolized Oil, take hold of membrane with left hand and twist it, while the right is passed in to where the membrane is attached to the womb; commence at top, gradually detaching it, working the fingers gently in between it and the womb; do not be harsh. Give the mare a teaspoonful of Saltpeter two or three times a day for a few days.

FLOODING—PROFUSE BLEEDING AFTER FOALING.—

Causes.—From failure of the womb to contract after foaling; from congestion or laceration; or with eversion of the womb.

Symptoms.—If blood accumulates in the womb from not contracting, it may be only suspected by reason of advancing weakness; swaying, unsteady gait; hanging head, paleness of the eyes and other mucous membranes, and weak, failing pulse. A hand examination in the womb detects blood clots. If it escapes from the vulva, the condition is evident.

TREATMENT.—

Give a large dose of Fluid Extract of Ergot—1 ounce—repeating in half an hour, and apply cold water or ice to the loins and external generative organs. Besides this, remove clot, if present, and flush out the womb with an Alum or Iron solution—from 1 to 2 ounces of Alum or Sulphate of Iron (Copperas) to each quart of water used. Flush as in "Leucorrhea," filling the womb full.

AFTER-PAINS.—These are the labor pains continued after the foal is out of the womb.

Symptoms.—Animal will continue to strain the same as though the foal had not been born.

TREATMENT.—

First examine to find cause; if another foal and correctly presented, allow her to expel it; if from bleeding, treat as under that head; if everything is normal, and the straining is due to nervous irritation, keep mare quiet, and watch her that she does not force the womb out, and give the following to relieve the pains:

Chloral Hydrate	1 ounce.
Water	½ pint.

Or:

Laudanum	1 ounce.
Fluid Extract Belladonna	1 teaspoonful.
Sweet Spirits Niter	1 ounce.
Ginger	1 tablespoonful.

Mix in lukewarm water and give as a drench; repeat every hour and a half or two hours, until relieved.

Put a peck of hot salt in a bag and apply that to the loins, or apply hot blankets as in "Inflammation of the Kidneys," and give her a hot bran mash. Stay with her until all straining ceases, and if womb should start to evert, prevent it by clasping lips of vulva and holding them together.

EVERSION OF THE VAGINA.—This is the turning out of the vagina, or passage leading from the womb.

Causes.—From standing in the stall with hind feet too low before foaling; from lying down, when on account of being so full, the womb presses back and forces the vagina out; from straining to pass manure.

Symptoms.—There is a bulging out of the passage through the vulva, forming a large red tumor; it may show only when lying down, going back when the mare gets up, or it may become swollen and remain out.

TREATMENT.—

Bathe the part well by pouring over it cold water, which removes the dirt and reduces the size; do not rub the part; if the

dirt does not all flush off, pick it off gently; follow by pouring over it slowly a quart of Alum water:

Alum	1 to 2 ounces.
Water	1 quart.

Also pour over it a weak Carbolic Acid solution:

Carbolic Acid	1½ teaspoonfuls.
Water	1 quart.

Now return it by placing the palm of the left hand against the back of tumor and gently pushing, and with the right hand near the vulva, gently work it back to place; see that the finger-nails of the right hand are short, so as not to irritate the part. After returning it, it must be retained; some do this by applying a truss, which allows the animal to make water, but prevents the return of the accident. Trusses are hard to keep in place, frequently get off, allowing the accident to re-occur; the best way to retain, is to put in sutures, or stitches, across the vulva. Use strips of good factory, an inch wide, for the stitches. To put them in, pick up a fold of the skin back from the vulva, four or five inches, where the hair commences, take a sharp knife and thrust the blade through this fold, between the fingers and the body, remove the blade, and before letting go of the fold, push one end of the stitch through the cut with a blunt nail, let go the fold and you have the stitch underneath an inch or more of skin, which will not tear out. Put the other end of the stitch through a fold on the other side of the vulva in the same manner, and then tie the two ends together across the vulva. Put in about three stitches, and there will be no chance for the accident to re-occur. The stitches will not interfere with urinating. If she does not strain, the stitches need not be tied tight. If she strains, give drugs as for "After-Pains." As the time for delivery approaches, she must be watched closely, and stitches removed as pains come on; after delivery and when the after-birth has been removed, put the stitches in again for a few days. After this accident, keep the animal where the hips will be the higher. Control the mare during the operation with a twist and side line, or hobbles, if necessary.

EVERSION OF THE WOMB—FOAL BED TURNED OUT.—If the womb fails to contract after difficult foaling, the after-pains will sometimes lead to the organ turning inside out and passing out through the vagina, hanging as a large red mass from the vulva, sometimes extending down to the hocks.

TREATMENT.—

Put hobbles on the mare if necessary to prevent kicking. Have two assistants hold a clean sheet under the womb to support it, and gently clean it as in the preceding disorder, using the cold water, Alum, and Carbolic lotions. Support the womb with the hands and flush off any dirt that may collect in the sheet; great care is necessary in cleaning the part. After this is done, return it by commencing around the vulva and putting it back. Have the assistants hold the womb as high as the vulva, so its weight will not pull it out. Sometimes by taking a long strip of cloth, commencing at the lower end and winding it round and around the womb as tightly as possible, it forces the blood out and reduces the size and helps in making it return more easily; then as the womb is returned, gradually unwind the cloth. Returning the womb is a long, hard job; don't get in a hurry, but be gentle. After half or more has been returned, it will go in much faster. After it has been returned, pass the oiled hand in and smooth the womb out as nearly natural as possible. Put in the sutures to retain it as in the preceding disorder. While it is being returned, and for some days afterward, keep the hind parts the higher. Give the mare at the beginning of the operation, to stop her straining, the drugs as recommended for "After-Pains," continuing their use for two or three days if there is any straining, giving every three or four hours. If the after-birth is still attached to the womb, remove it before returning. This is a serious accident with the mare, and if the womb gets injured while out, chances for recovery are very slight. As there is a tendency for inflammation to set in, the following treatment should be given after the womb is returned. Feed very light, on easily digested, laxative food, and give from a pint to a quart of

raw Linseed Oil and from 2 to 4 ounces of Epsom Salts daily to keep the bowels loose; also use the following:

Fluid Extract of Belladonna	2 ounces.
Fluid Extract of Aconite	2 drachms.
Alcohol	6 ounces.
Saltpeter	4 "
Water to make	1 quart.

Dose: 2 ounces three or four times a day, continuing five or six days.

If after a time, the animal becomes dull, pulse becomes more rapid, temperature rises, inflammation is developing; then treat as for "Inflammation of the Womb." Remove the sutures after conditions appear to be normal.

RUPTURE OF THE WOMB.—This may occur from the feet of the foal during delivery, or from ill-directed efforts to assist, but it is especially liable to occur when there is an eversion of the womb. The resultant dangers are bleeding from the wound, escape of bowels through the opening, and their fatal injury by the mare's feet or otherwise; from peritonitis, and from the escape of poisonous liquids of the womb into the abdominal cavity.

TREATMENT.—

If in an eversion of the womb, the first thing to do is to close the wound, which must be carefully sewed up before the womb is returned, with catgut sutures. After its return, inject daily of the following: Boracic Acid ½ ounce, or Carbolic Acid 3 drachms, to 1 quart of water. If inflammation threatens give treatment as for "Inflammation of the Womb." When from feet of foal, or from ill-directed effort to assist, little can be done, other than the medicinal treatment; it will probably prove fatal.

RUPTURE OF THE VAGINA, OR PASSAGE.—When this happens it occurs during the act of foaling, and is done by the legs of the foal in coming through the passage not coming straight, or from the foal being too large for the passage. In some cases where the mare is not attended at the outset, the legs are found, one out through the natural passage, and the

other by a rupture, through the anus. Again, the mare may have seemingly foaled all right, but later manure is seen coming through the vulva. An examination with oiled hand and arm will locate the rupture.

TREATMENT.—

If in a case where foal is coming out, and is caught with a leg in each passage, oil the hand and push back into womb, and bring both legs out the right way. Keep mare very quiet and give soft feed, with plenty of Flaxseed in it to keep the bowels free, and if in season let her have fresh cut grass. If bowels are costive, give 1 pint doses of Linseed Oil to keep them open, but not too loose. If feverish, use the prescription as in "Eversion of the Womb." Flush out the vagina twice a day with the following: Boracic Acid 1 ounce, water 1 quart; close lips of vulva around the tube and fill vagina full; once a day flush with Carbolic Acid 2 teaspoonfuls, water 1 quart. Use tube and funnel, as for "Leucorrhea."

INFLAMMATION OF THE VAGINA AND VULVA.—

Cause.—Often follows a difficult case of foaling.

Symptoms.—The vulva is inflamed and swollen and the membrane of the passage a bright red, with more or less discharge.

TREATMENT.—

Give the animal 1 pint of Linseed Oil to move the bowels, and then keep them free, feeding soft food with boiled Flaxseed in it. If in season, feed freely with fresh cut grass; if not, bran mashes with 3 to 4 ounces Epsom Salts daily. Bathe outside of vulva with warm water, and flush out vagina as in preceding disorder, and give internally the prescription as recommended for "Inflammation of the Womb." Use injections and bathing freely.

INFLAMMATION OF THE WOMB—METRITIS.—

This is an inflammation of the substance of the womb.

Causes.—From injuries to the womb during or after a difficult case of foaling; from exposure to cold or wet; from the

action of putrid products in the womb, and from using dirty instruments, ropes and hands when assisting in delivery; also follows eversion of the womb.

Symptoms.—Usually comes on two or three days after foaling. There is first shivering, staring coat, small, rapid pulse, elevated temperature, quickened breathing, loss of appetite, arched back, stiff movement of body, looking back at flanks, uneasy motion of hind legs, discharge from vulva of a reddish or yellowish fluid, which later may be whitish or glairy, and fetid or not. By passing oiled hand in through the vagina, the womb will be found to be hot, swollen and sensitive.

TREATMENT.—

Give a laxative in the form of a pint to a quart of raw Linseed Oil and 3 or 4 ounces of Epsom Salts, and repeat Oil daily to keep bowels active; also give the following:

Fluid Extract of Belladonna	1 ounce.
Fluid Extract of Aconite	1 drachm.
Alcohol	4 ounces.
Saltpeter	2 "
Water to make	1 pint

Dose: 2 ounces four or five times a day.

If temperature runs high, give 1 drachm of Acetanilid and an ounce of Alcohol in ½ pint of water morning and night. Half-drachm doses of Quinine two or three times a day are also good. Flush out the womb very freely with warm water until water flows away clear, then inject twice a day:

Boracic Acid	1 ounce,
Warm water	1 quart,

And also twice a day:

Carbolic Acid	2 teaspoonfuls.
Warm water	1 quart.

In flushing, use tube and funnel as in "Leucorrhea," filling womb full by closing lips of vulva with the hand. Apply, almost continuously, hot blankets to the loins, as in "Inflammation of the Kidneys." Mustard paste applied to the loins is also good. If much pain is manifest, give 3 grain doses of Morphine every three hours.

Following the flushing out of the womb, watch her to see that the straining does not evert the organ.

INJURIES TO HIPS DURING FOALING.—

Symptoms.—There will be a falling away of the muscles on the affected side, and the animal will be stiff and lame.

TREATMENT—

Apply to the muscles of the hip on the affected side some good, stimulating liniment, and if this fails, blister as described under "Ring Bone." During treatment let animal run to grass, which will also give needed exercise. Some time is required in such cases for complete recovery.

INFLAMMATION OF THE UDDER—MAMMITIS —GARGET.—

This is an inflammation of the glands that secrete the milk.

Causes.—From exposure by lying on the cold, damp ground, in fall or spring; from foal not sucking properly; or from injury. Not very common with the mare.

Symptoms.—One or both the milk glands become enlarged, hot, and tender; the milk dries up, or is replaced by a watery, or reddish serous fluid, which at times becomes fetid; animal may walk lame, lose appetite, and show general disorder and fever.

TREATMENT.—

Give ½ pound of Epsom Salts and repeat in two days if bowels do not move quite freely; also give internally the following:

Fluid Extract Belladonna	1 ounce.
Fluid Extract Aconite	1 drachm.
Saltpeter	2 ounces.
Water to make	1 pint.

Dose: 2 ounces three or four times a day.

Bathe the udder with hot water for two or three hours at a time, and then apply one of the following: Camphorated oil, or:

Turpentine	1 part.
Spirits of Camphor, or Lard	4 parts.

Or:

Turpentine	2 ounces.
Fluid Extract of Belladonna	2 "
Soap Liniment	4 "

If milk should become thick, inject into the udder, through a milking tube, warm water 1 pint, Carbolic Acid 1 teaspoonful; then knead the udder thoroughly and milk out. If an abscess should form, open it and wash out with a Carbolic Acid solution.

SORE TEATS, CRACKS, WARTS.—From sucking, especially in cold weather, the teats are subject to abrasions, cracks and scabs, and as the result of such irritation, or independently, warts sometimes will grow and become troublesome. These should be clipped off with sharp scissors and their roots burned with a stick of Lunar Caustic. For sore teats use an ointment made of:

Vaseline	1 ounce.
Balsam Tolu	5 grains.
Sulphate of Zinc	5 grains.

Mix and apply.

Or:

Vaseline	1 ounce.
Subnitrate of Bismuth	½ "
Carbolic Acid	15 drops.

PUERPERAL FEVER.—This is a benign fever, usually occurring on the second or third day after foaling. It is aggravated by colds, exposure, or neglect.

Symptoms.—Are those of a general fever, accelerated pulse and respiration, higher temperature; ears and extremities are cold; bowels constipated; urine scanty and high-colored; milk secretion suspended; udder inclined to inflammation and hardness; appetite more or less affected. May occur in mares of all ages, but is most often met with after the first pregnancy, and it seems to accompany the effort of nature to secrete the milk. The symptoms of the more severe disorders are absent.

TREATMENT.—

Keep the animal warm, but in a place where there is plenty of fresh air. Give soft food, grass if in season, and plenty of pure water to drink; give internally the treatment as recommended to be given internally for "Inflammation of the Udder." One-half drachm doses of Quinine twice a day are also good. Recovery generally takes place in two or three days unless complications arise.

SWELLING ALONG THE BELLY BEFORE FOALING—DROPSY.—This begins at the udder three or four weeks before foaling, and extends gradually forward until the swelling reaches between the fore legs. The animal shows no signs of being sick, and eats as well as usual.

TREATMENT.—

If mare is accustomed to being shut up in the stable, let her out where she can have exercise every day, and give the mixtures as recommended for "Chronic Indigestion," giving about one-half the dose. Keep the bowels moderately loose by repeating ½ pint doses of raw Linseed Oil and laxative foods. Not serious usually, but best to be looked after. Mare is usually all right after foaling.

ABORTION, OR SLINKING THE FOAL.—This is a term used in case the fœtus is expelled from the womb before it is capable of surviving outside that organ. If advanced enough to live, but before the regular period, it is called premature birth.

Causes.—From over work; from injury in any way; from sight or smell of blood, if it frightens; from slipping; from acute disease; from poor feeding and over-feeding.

Symptoms.—Vary according as early or late in pregnancy. In first or second month, mare may miscarry without observable symptoms, and fact only appears by her coming in heat. If somewhat later, there will be loss of appetite, neighing and straining, and the small fœtus is expelled with its coverings. At a still later stage the symptoms will be still more marked, and mare will be very restless, get up and down, walk around until the labor pains come on, which soon cause the water bag to appear and break, and delivery will soon be completed if presentation is correct. This may occupy in all an hour or two, or may continue a day or two, the symptoms subsiding for a time, only to reappear with renewed energy.

TREATMENT.—

Should be preventive, if possible—avoiding all conditions which might cause the accident. After the pains come on, it is doubtful if the accident can be prevented. Fluid Extract of

Black Haw, in from ½ to 1 ounce doses, is sometimes used, repeating every three or four hours, until quiet; ½ ounce doses of Chloral Hydrate, in ½ pint of water, may also be given. If pains continue, however, but act does not progress, assist, as with difficult parturition. Give the animal rest for a few days, feed lightly, giving bran mashes, small doses of oil and a teaspoonful Saltpeter three times a day. (See Contagious Abortion in CATTLE DEPARTMENT).

DISEASES AND CARE OF YOUNG FOALS.

BLEEDING FROM THE NAVEL.—This is caused by the blood vessels not closing when the cord is broken.

Symptoms.—Blood dropping from the end of the cord; may be slight or rapid.

TREATMENT.—

Tie a string around the cord about an inch from the body. If the cord is broken off so short that it cannot be ligated, fold a piece of cloth, saturate it with Alum, or Copperas water (an ounce of either to ½ pint of water), place the cloth against the navel, and hold it in place by a bandage about the body; have the bandage tight. Use Carbolic Acid lotion.

Sometimes the urine will flow from the cord. There is a tube leading from the bladder down through the cord in the fœtus, and when this does not close, as it should when the cord breaks, the urine flows from it. The treatment is to ligate, the same as for bleeding. Sometimes the other natural opening is not formed and then ligating will cause death, but if the natural duct cannot be opened, the foal may as well be destroyed.

CONSTIPATION IN YOUNG FOALS.—There is difficulty sometimes in getting the bowels of a young foal to move.

Causes.—From the mare being fed on very dry food, and from foals not getting the mother's first milk, which is a laxative.

Symptoms.—Foal will be noticed to be fuller than usual; does not want to suck; strains as if wanting to pass something, but without results; and sometimes will lie down and look around at his sides as though in pain. If not relieved in a little while, refuses to get up.

TREATMENT.—

Give small injections of lukewarm water, with a little raw Linseed Oil in it, three or four times a day. In some cases it is necessary to oil the finger and insert it in the rectum to clear out the hardened feces, but in so doing be careful about irritating the bowels. Give 2 or 3 ounces of raw Linseed Oil and 1 teaspoonful of whiskey, mixed well together, repeating this three times a day, until the bowels move and the foal seems better. In very obstinate cases from ½ to 1 ounce of Epsom Salts can be given. This is for a day-old colt, and the amount can be increased in proportion to size. Keep colt warm and comfortable.

DIARRHEA IN YOUNG FOALS.—This is the reverse of above.

Causes.—From exposure and lying on damp ground too soon after foaling; from excitement by the mare being turned in with other horses; from the mare's milk being too rich, or too poor; or from sucking while the mother is too heated up from work.

Symptoms.—Are obvious in the watery discharges.

TREATMENT.—

If the cause can be discovered remove it, whether in surroundings, milk, or conditions of feeding. Give the colt:

Whiskey	1 teaspoonful.
Laudanum	1 "
Flour	1 tablespoonful.

Mix all with a little of the mare's milk and repeat every four or five hours until foal is relieved.

Keep the body of the colt warm. A little Linseed or Starch gruel is also good. If these fail, Copperas is good—dissolve a

teaspoonful of Copperas in 2 ounces of water and give a teaspoonful of the solution in a little milk, alternated with the Laudanum mixture. From 1 to 3 teaspoonfuls of the following is good:

Corrosive Sublimate..... 4 grains.
Water .....½ pint.
Dissolve Corrosive Sublimate in the water and give as directed.

LEAKING OF THE NAVEL, AND RHEUMATISM IN YOUNG FOALS.—

Causes.—By some it is said to be due to a germ getting into navel, while others say the cause is a cold, a chill, or an injury.

Symptoms.—At first one hind leg will be noticed as being lame, and some joint swollen and tender; and there will be more or less discharge at the cord. Navel may also be swollen and inflamed. Swelling in leg may move from leg to leg for a few days, when it will settle in one of the joints, which is apt to fester and break, the discharge being offensive. When this ceases to run and begins healing, another joint will swell and fester; this condition keeping up until colt weakens and dies. Sometimes the joints do not break, but the navel discharge is continuous, resulting finally in death from exhaustion.

TREATMENT.—

If attended to at the outset, it is curable. Apply Monsell's Solution of Iron to the navel with a feather two or three times daily, and if inflamed, foment with hot water. Give the foal ¼ teaspoonful of Salol in a tablespoonful of oil and a little milk three times daily. Foment the swollen joints with hot water and apply a good stimulating liniment; if they break, continue the bathing and use Carbolic Acid solution. The following will also be good to give:

Fluid Extract of Belladonna..... 1 drachm.
Fluid Extract of Aconite..... 12 drops.
Sweet Spirits of Niter..... 1 ounce.
Water to make..... 1 pint.
Dose: 1 to 2 ounces three to five times a day.

Keep the colt quiet and warm, and help it up to nurse.

WEAKNESS IN THE LEGS AND JOINTS OF YOUNG FOALS.—Bandage legs to support and strengthen them, giving first a good hand rubbing. If down and cannot get up, raise him up several times daily to suck, and give him a chance to put strength in his legs.

CROOKEDNESS OF THE LEGS IN YOUNG FOALS.—Sometimes they will be over on the knees, while in other cases the crookedness will be in hind legs.

TREATMENT.—

Leave the foal alone; do not try to do anything with the legs. Simply feed him well, and as he gets strong on his legs, they will straighten up.

DISTEMPER IN FOALS.—See "Distemper, or Strangles," page 197.

CASTRATION—DISEASES AND TROUBLES FOLLOWING

This operation had best be left to the veterinarian, whenever it is possible to do so. It is usually done at one year of age, but may be accomplished when a few weeks old, at the expense of an imperfect development of the fore parts. The simplicity and safety of the operation are greatest in the young, but a delay until two, three, or four years old will, in some cases, secure a better development and carriage of the fore parts. The essential part of castration is the safe removal or destruction of the testicle, and the arrest and prevention of bleeding from the spermatic artery found in the anterior part of the cord. The months of April, May or June are the best months to operate in, after the colt has been turned out to grass for ten days or more, and is shedding his coat. The fall of the year is also a good time for operating.

PRECAUTIONS BEFORE OPERATING.—Do not operate on a colt unless he is in good condition and healthy. Select a time when the weather is right—neither too hot, nor too cold—avoid cold winds and damp weather particularly. If more than a year old, feed lightly the day previous, so the bowels will be empty, as it makes it easier on the colt when thrown and tied. Find out before throwing, by question and examination, if the colt has been ruptured; and also see if both testicles are down before throwing the animal. Wash and oil the sheath of old horses a few days in advance of operating, as it often prevents swelling.

THROWING, OR CASTING, A HORSE.—Under OPERATIONS two methods of casting a horse are given, but we give another here, which is commonly practiced in this country—the rope tackling. Take about 40 feet of ¾-inch rope; make a loop by doubling it in the center, tie a knot, and slip the loop over the head; pass the ends of the rope back, one on each side, and run the rope through the ring in the hind hobble, which is made of a heavy thick strap, and buckles on the hind leg below the fetlock, and has a ring in front of it to run the rope through. Pass the rope forward, after it is put through the ring in the hobble, up to the neck, and through the loop at the neck. Repeat on the other side. Now have a man at the head back the colt, pulling the head to one side, and pushing towards the other side, while a man on each side pulls on the ropes. This will throw the animal and he can be securely tied, so as not to hurt himself. He will throw more easily if one front foot is strapped up, as described under "Training a Vicious Horse." Roll the colt partially upon his back, and place a rail along the side, and he is in a position for operating. Some operate standing.

EXPOSING THE TESTICLES.—This part of the operation is the same with all the methods. First, have the knife and all instruments, or cords, if used, lying in a solution of Carbolic Acid for one-half hour before the operation. When everything is ready, wash the scrotum with some of the Carbolic

solution, and also the hands; take one of the testicles in the left hand and roll it so that it lies perfectly straight with the dividing line of the scrotum, and so the line comes nearly on top of the testicle; hold the testicle firm, take the knife, which should be very sharp, and make a good free cut, about one-half inch from the dividing line, and straight with it, down onto the testicle; try and cut through with one stroke, so that the testicle will pop out; if the testicle does not come out with the first stroke, make another and it should; if cut clear down onto, the testicle will pop out easily. After the testicle pops out, pick it up with the left hand and cut the thin attachment back of the cord, which leaves the back end of the testicle free. The testicle can then be drawn out further and removed by some one of the following methods. Repeat the operation on the other testicle, dash a little of the Carbolic solution into each of the wounds, and let the colt up.

OPERATING WITH CLAMPS.—This is the old method and should not be used, as the newer methods, given below, are less painful. The clamps were made of good, tough wood, four or five inches long, grooved along the center of opposing surfaces, which were filled with an ointment made by mixing 1 drachm of Sulphate of Copper with 1 ounce of lard. One end of the clamps were tied with strong twine, leaving the other end free. The exposing of the testicle was the same as now practiced with the other operations. After being exposed the testicle was taken hold of with the left hand and the clamp with the right, and slipped over the cord, drawing the cord just moderately tight, and spreading it out in the clamp; the clamp was then tightened at the end that was not tied, with a pair of castrating pincers, and tied good and tight with strong twine. The testicle, and the part of the cord below the clamp, leaving from a half to an inch of the cord, was then cut off and the clamp left in place for twenty-four hours; then by cutting the twine at one end of the clamp, the latter was opened and the stump liberated without danger of bleeding. If the stump hung outside the wound it was pushed inside with the finger and left there. A clamp was used for each testicle, and placed so as to lie lengthwise of the scrotum.

OPERATING WITH THE ECRASEUR.—This is a newer method of operating and is not so painful as that by the use of clamps. After liberating the testicle, slip it through the looped chain of the ecraseur and slip the chain up the cord some two or three inches from the testicle, then draw chain down and by slowly turning the ratchet, crush the cord off. The secret of success is to turn slowly so as not to crush the cord too rapidly; it is the crushing which stops the bleeding, and when crushed too rapidly, bleeding sometimes follows. When the cord is crushed off, the body end goes back into the scrotum out of sight. In placing the ecraseur over the testicle, place the blunter side of the slot through which the chain draws, next to the body; it crushes more than the sharp side, which tends to cut.

In colts two or three years old, as an extra precaution against bleeding, the cord may be crushed twice, the first time the ecraseur is turned down and crushes the cord some, but not clear off; then loosen up the ecraseur, drop it down half an inch and crush the cord off.

OPERATING WITH THE EMASCULATOR.—The emasculator is an instrument something like a pair of pincers with one arm having a single jaw and the other a double, the single working between the double. One side of the jaws is roughened so as to crush, the other is sharp and cuts. The instrument is used by placing the cord between the jaws some two or three inches from the testicle, being sure that the rough side is next to the body so as to crush the end of the cord; close the jaws by pressing the handles and the testicle is cut off and the body end of the cord crushed. Some prefer this instrument to the ecraseur; it is a little more rapid, and better where the animal is operated upon standing. One or the other of these two instruments is used almost exclusively now in operating upon colts.

OPERATING BY SEARING.—This is another old method and still used in some sections; it is a modification of the clamp system. Iron clamps are used instead of wooden ones. Cut the cord close to the clamp, and have a hot iron ready; dip it in oil and sear the end of the cord and artery; this prevents bleeding.

Now remove iron clamp and the cord goes back into the scrotum. Operate on the other testicle in same manner. By oiling the iron, it is kept from sticking and pulling away the scab.

OPERATING BY LIGATURES.—This is used more on bulls and boars than on horses. It is much like the clamps, differing by tying a string around the cord in place of the clamp. Better than the clamp, for as soon as the testicle is cut off, the cord goes back into the scrotum, and so relieves the pain caused by keeping it drawn down so long. The ligature does not need to be put on as tight as the clamps do, and so is not so painful—just tight enough not to slip off. Catgut should be used, as it will be absorbed and cause no trouble; a guitar or violin string answers nicely.

CASTRATING ORIGINALS, OR RIDGLINGS.—CRYPTORCHIDS.—This is the removal of a testicle or testicles that have not descended into the scrotum, but have been detained in the inguinal canal or inside the abdomen. The cause of this is not fully understood. The operation is one requiring expert knowledge, and space will not be taken up in trying to describe it here. If testicles are not down in a yearling, it is best to let the animal run over for a year or so, for the testicles often come down of themselves later on.

PAIN AFTER CASTRATION.—Sometimes a colt will manifest colicky pains after castration; if so, give ½ ounce of Laudanum, or ¼ teaspoonful of Fluid Extract of Belladonna to a yearling. Repeat in an hour, if necessary.

HOW TO CARE FOR A COLT AFTER OPERATION.—Put the colt in a stable and keep him quiet for from twelve to twenty hours, then turn him out, taking him up cold nights, and in rainy, damp weather; if weather is so he cannot run out, exercise each day. Feed on grass only. The day after the operation, oil the fingers of the right hand and place them between the edges of each wound, opening them, as they are apt to be stuck together and prevent discharging. Repeat each day for three or

four days, to be sure the cuts are kept open. If colt commences to get at all stiff, or swelling becomes extensive, flush out the wound twice a day with:

Carbolic Acid	½ ounce.
Water	1 pint.

Use a bulb syringe and flush out freely. A twist on the nose will control the colt. After two or three days there should be some discharge. If swelling should become very bad, bathe the scrotum with hot water.

BLEEDING AFTER CASTRATION.—This may be from the veins in the scrotum, or from the artery of the cord. If from the veins, it can be told by its dribbling away from cuts and from its dark color. From an artery the bleeding is more rapid and may come in jets, and is a bright red color.

TREATMENT.—

If warm weather, and the veins bleed too continuously, dash cold water onto the scrotum. Cold water dashed onto the loins will also help stop the flow of blood. Occasionally the scrotum will have to be plugged with cotton saturated with an astringent lotion, as Alum or Copperas 2 ounces, water 1 pint; injecting the lotion into the scrotum may check flow. Remove cotton next day.

If from the artery in the cord, put a twist on the colt's nose, and then reach up into the scrotum with the thumb and first finger, find the end of the cord; bring it down, and have an assistant tie a string around it; use catgut, if possible, if not, leave ends of string long, so they hang from the scrotum, and the string will then come away later. If the cord cannot be reached, plug scrotum as above. Monsell's solution, diluted with equal parts of water, is more powerful than the Alum or Copperas solution, but is more irritating. In reaching into the scrotum use Carbolized Oil on the hands.

RUPTURE (HERNIA).—It sometimes occurs that the animal has a small rupture that was not noticed before operation was performed; or, in some cases the animal will rupture himself at time of operation.

Symptoms—Bowels will be noticed to be hanging out of the cut; there may be but a few inches, but sometimes they will come down so that they will be trampled under foot. If very far out, and they become strangulated and inflamed, the horse will be in great pain and act as in inflammation of the bowels. Bowels will be bluish-red, and after a time, if left out, will become mortified.

TREATMENT.—

If bowels are out, inflamed and bruised under the feet, and he seems in great pain, nothing perhaps can be done but kill the horse. If only a small amount of bowel is out, cast animal and secure him. Flush off the bowel with:

Carbolic Acid	2 teaspoonfuls.
Water	1 quart.

Pick up the inner lining of the scrotum and sew up the cut in it, or plug up the scrotum with cotton saturated in the Carbolic Acid solution. If the cotton is used, one stitch best be taken in the cut in the scrotum, to keep it in; remove a part only of the cotton the following day, the remainder of it the second and third days, by which time the opening through which the bowel came will be closed. Feed a laxative diet and give ½ teaspoonful of Saltpeter three times a day.

FATTY CURTAIN COVERING THE BOWELS COMING DOWN AFTER CASTRATION.—Sometimes where there is a slight rupture, and after animal has been about for a few hours, the fatty curtain covering the bowels comes out. It may be but a few inches, but may be a couple of feet. It is generally red in color and has a fatty appearance. It may cause the animal no inconvenience, as he seems to feel well and has a good appetite.

TREATMENT.—

The same as for "Hernia;" or, remove the lining that hangs out with a pair of scissors or a knife, and see that no more comes down. There is but little danger from bleeding.

ABSCESSES IN SCROTUM AFTER CASTRATION.—This sometimes occurs after animal is apparently well.

Causes.—A piece of the dead cord; some dried matter; from the ligature when an ordinary string is used.

Symptoms.—There is heat, pain, and swelling in the scrotum; soreness to the touch and stiffness of the gait in hind parts.

TREATMENT.—

Encourage formation of matter by poultices, and when it "comes to a head," open and let the matter escape. In some cases, when poulticed, it will break of its own accord. After it is open, flush it freely with:

Carbolic Acid	½ ounce.
Water	1 pint,

And repeat daily until well.

SWELLING AFTER CASTRATION.—A small amount of swelling is not a bad sign, and is to be expected, but when very bad, so that it affects the animal's appetite, and inclination to move about, the discharge being changed to a watery character, and red in color, the case assumes a serious stage and needs attention.

Causes.—From exposure; from allowing wounds to heal too soon; or from lack of cleanliness in operation. Dirty quarters may also be a cause, as also a bad condition of the blood.

TREATMENT.—

Keep the bowels open with small doses of raw Linseed Oil; bathe cuts well with warm water. After parts have been bathed, flush out freely with antiseptics.

Carbolic Acid	½ ounce
Water	1 pint.

After bathing and opening cuts, and washing them out, apply a poultice of warm Linseed meal and bran, and hold it to wound by means of strings over the back. Repeat bathing, flushing and poulticing three or four times daily. Feed soft food and give the following:

Fluid Extract of Belladonna	½ ounce.
Fluid Extract Aconite	½ drachm.
Alcohol	4 ounces.
Saltpeter	1 ounce.
Water to make	1 pint.

Dose: 1 ounce for a yearling, 2 ounces for a two-year-old, three times a day.

In bad cases, where swelling extends along under the belly also give:

Tincture of Iron	2 drachms.
Quinine	¼ drachm.
Water	½ pint.

Give as one dose; repeat three times a day.

Give gentle exercise, and as soon as horse begins to eat, and the discharge is a healthy, white one, the condition may be considered favorable.

SCHIRRUS CORD—TUMOR OF THE CORD.—This is a growth at the end of the cord.

Causes.—From cord being pulled down in removing clamp; from colt biting and pulling down on account of itching. When not put back into the scrotum, after removing clamp, the cut heals around it and holds it down, and the cord being exposed to the air becomes irritated and diseased, and a growth forms at the end. Much more common when clamps were used.

TREATMENT.—

If it is noticed at the time, bathe in warm water to soften cut, and with oiled fingers, break cord loose from skin and push back into scrotum. If not noticed at the time, and it gets large, it will be necessary to operate on it. Cast animal and secure him. Break the skin from cord with the fingers, using knife only when necessary to get the cord loose. Put a clamp on or ligate the cord so the diseased part can be cut off below the clamp, and leave the clamp on, when used, for two or three days. Then cut twine off and remove. An ecraseur best be used to crush the cord. If animal swells after operation, treat as directed in such conditions after castration. Feed with soft feed, adding Flaxseed to keep bowels free. Serious cases would require professional service. Profuse bleeding is apt to follow the separating of the tumor from the surrounding tissue.

PERITONITIS FOLLOWING CASTRATION.—This is an inflammation of the lining of the scrotum and extending up and including the lining of the belly cavity.

Causes.—From bungling work in operating, and from filthy instruments and hands; from too severe medicines used on clamps, when used; from exposure by lying out on damp ground, or from cold winds and rains. Inflammation begins in the scrotum and extends upward until the serous membrane of the abdominal cavity is involved. It generally comes on about the third or fourth day after castration.

TREATMENT.—

Treat cuts as in "Swelling after Castration," and give general treatment as in "Peritonitis," giving a yearling colt ¼ the dose prescribed for the adult.

LOCK-JAW (TETANUS) AFTER CASTRATION.—This comes on from the ninth to twenty-first day after operating, and may ensue in a case that is apparently doing well.

Causes.—The disease is due to the germ which causes it, gaining entrance into the wound, and the wound healing over, forms an ideal condition for the development of the disease.

TREATMENT.—

See "Lock-Jaw" in DISEASES OF BRAIN AND NERVOUS SYSTEM.

BLINDNESS (AMAUROSIS) FOLLOWING CASTRATION.—This disease is sometimes noticed to come on after castration, especially if animal bleeds freely at the time. For further detail, see article on the subject in DISEASES OF THE EYE.

RUPTURES (HERNIAS) AND METHODS OF TREATMENT

SCROTAL HERNIA, OR RUPTURE INTO THE BAG.—This is a case where the bowels pass down through the abdominal rings, into the scrotum.

Causes.—Some foals are ruptured at birth, and may never recover from it. Running, jumping, or other violent exercise, may result in hernia, or it may occur in castration.

Symptoms.—The scrotum is larger than it should be, and on pressure the bowel will go back through the ring to the belly cavity, but descends again as soon as pressure is relaxed. It may affect one or both sides, most often but one.

TREATMENT.—

If in a colt that has not been castrated, this may be got rid of by castration, though it will often disappear if let alone for some time. If a colt has a hernia at one year old it is often well to let him go longer and it may disappear. In case it is desired to castrate and cure rupture at same time, have animal fast a day or so before operating, then cast and secure him, as in ordinary castration. Push the bowel and fatty lining back into the belly, and taking up the testicle in the left hand, also allow the hand to rest on the opening where the bowel comes out; expose the testicle, as in ordinary castration, except that the innermost covering is not cut through, but pressed out of the scrotum along with the testicle, and when out, slip the clamp over the cord, and cover and fasten it securely, as described under CASTRATION. Cut off the testicle's covering below the clamp. This will prevent the rupture from coming down. A day or so after operation the swelling will fill up the opening where the bowel came down, and the rupture will disappear. Remove the clamp after four or five days. A good ligature may be used in place of the clamp. In the case of a stallion, treat in the same manner. For treatment of castrated horses see "Rupture Following Castration." It is always best to secure a veterinarian for this operation, if possible.

INGUINAL HERNIA, OR RUPTURE INTO THE ABDOMINAL RINGS.—This may be called an incomplete scrotal hernia, and like the latter, may exist and cause no sign of distress, or it may become strangulated and cause the death of the animal. This form is seen most in stallions.

Symptoms.—When during the existence of symptoms as in colic, we find a stallion kicking with his hind feet, while standing or lying on his back, we should look at once to the inguinal region or to the scrotum. There is a soft, puffy swelling on the surface in the groin that ought to be smooth, and by pressure is easily pushed back, but only remains so long as pressure is maintained. By examining through the rectum just in front of the floor of the bony arch, the bowel may be detected passing into the ring. One or both sides may be affected.

TREATMENT.—

There is probably no successful treatment that an unskilled person could give, so space will not be given to describe treatment, except to say that the immediate treatment is to remove the loop of the intestine by pulling it out of the ring, the hand being in the rectum. If it is relieved, it is apt to re-occur unless the animal is castrated.

VENTRAL HERNIA, OR RUPTURE OF ABDOMINAL WALLS.—In this form there is a protrusion of the bowel through a rupture in the abdominal walls, to the skin. It may occur in any part of the belly, except at the navel.

Causes.—Kicks, blows, hooks, severe jumping, or pulling, etc.

Symptoms.—There is a swelling, and when animal is placed in favorable position the intestines can be made to disappear, and there can be felt the opening or rent in the abdominal coats or tunics.

TREATMENT.—

In many cases there is no occasion for treatment; and again, where the rupture is too extensive, treatment does no good. If hernia is not large we may attempt a cure by the methods used

in "Navel Rupture," or if fortunate enough to be present when the rupture occurs, and particularly if not large, an application of a pad and broad bandage may effect a cure. It is possible for a surgeon to cut through the skin and sew up the rupture in the muscular wall, then sewing up the cut in the skin. Keep the animal quiet.

NAVEL, OR UMBILICAL RUPTURE.—When the navel opening does not properly close at the time of birth the bowels come down through the opening and form a pouch or sac in the skin, varying in size from that of a hen's egg to that of a man's fist. Like other forms of rupture at birth, it may disappear entirely by the time the animal has reached its second or third year. Age favors self cure.

Causes.—One of the principal causes of this form in colts is keeping the little fellow from the dam, causing him to neigh, or cry. The contraction of the abdominal muscles and pressure on the bowels during neighing seem to open the umbilicus and induce rupture. It may be caused in adults by accidents, but is very rare.

TREATMENT.—

Keep the animal fasting for twenty-four hours; cast, and secure him. Return the bowel carefully into the abdomen, draw up the skin over opening and put a heavy stiff clamp on it; secure both ends of clamps with stout cord and run two skewers, or two or three darning needles, through the skin, below the clamp, to prevent it slipping off. (Break off points of darning needles to prevent catching.) Let animal up and leave the clamp on until it falls off of its own accord, which is usually from twelve to fifteen days, by which time the opening will heal up and the rupture be cured. Watch raw place left by the clamp, especially in warm weather, and dress occasionally with Carbolic lotion to keep off flies. A modification of above is to use a cord in the place of the clamp. Great care must be taken not to draw skin too tight, as this would cause too speedy a slough of the skin, the opening not having time to close, the intestines would come out and death ensue. A pad with broad bandage, having

rubber in it, is sometimes used, but it is difficult to keep in place. Blisters are often applied over swelling, and as skin hardens and contracts, by formation of scabs, an artificial bandage, or pressure, is produced, that at times is successful. Another method is to clip the hair from the skin over the swelling, and then apply Nitric Acid with a small brush, using only enough to moisten the skin. This sets up a deep-seated inflammation, that in many cases closes the opening. The surgeon can operate the same as in "Ventral Hernia."

DISEASES AND INJURIES OF THE EAR

DEAFNESS.—

Causes.—By an excess of noise; or from a disease of the drum.

Symptoms.—Animal seems stubborn, and cannot be taught to obey commands.

TREATMENT.—

Little can be done. Place a twitch on the horse's nose, and pour a little Olive Oil in his ears; this sometimes benefits.

INJURIES OR CUTS AROUND THE EAR.—If the skin or cartilage is torn, put a twitch on animal's nose; take a needle used for sewing cuts in skin, and draw edges together with silk. Bathe well with warm water twice daily and apply Carbolic lotion.

DISEASE OF THE CARTILAGE.—

Causes.—Usually an injury of some kind.

Symptoms.—The cartilage will fester and break at times where affected.

TREATMENT.—

Put a twitch on horse's nose, and with a sharp knife split skin and tissue open to the diseased part; scrape out all diseased matter, and cauterize with a stick of Lunar Caustic. Afterwards treat as an open wound.

TUMORS OF THE EAR.—Sometimes tumors of various sizes and shapes are seen in the ear of the horse.

Causes.—Irritation and inflammation of the skin of the ear, producing small pimples of proud flesh.

Symptoms.—Shaking of the head; will not allow familiarity; runs or starts back when collar is taken off over the head.

TREATMENT.—

Remove with the knife, scissors, or with a stick of Luuar Caustic. Then apply remedies as for a simple sore.

FROST BITES OF THE EAR.—Bathe with cold water as soon as observed, and apply the White Lotion (see page 263) afterward, three or four times daily. If taken in time it will save the ear. If ear becomes dead and drops off, treat the same until healed. An application of snow is good to draw out frost, if noticed while frozen.

DISEASES AND INJURIES OF THE EYE

SIMPLE OPHTHALMIA—CONJUNCTIVITIS.—This is an inflammation of the outer covering of the eye and the lining of the eyelid.

Causes.—The result of an injury by whips, sticks, twigs, or the presence of foreign bodies, as hayseed, chaff, lime, sand, ammonia arising from excretions, etc. It may also arise from extremes ot heat or cold, or from exposure. It may accompany other diseases.

Symptoms.—The eye is kept partly or nearly closed, eyelid swollen, and tears flow copiously down the cheek; the lining is red and inflamed, with haw drawn well up in the eye. After a day or two the eye becomes clouded with a film-like substance, and if neglected, this condition becomes more pronounced, and becomes chronic, resisting treatment, and finally ends in blindness.

TREATMENT.—

Make a careful examination and remove offending object, if from presence of some substance in the eye. A silk handkerchief passed over the head of a pin may be used. If from other causes, remedy them. Make a thick pad of woolen cloth, wet in cold water, and bind on over the eye, applying fresh water every half hour; keep the cold pack on almost continuously during the day; drop into the eye three times a day, from a medicine dropper, 10 to 20 drops of the following:

Nitrate of Silver.....	3 grains.
Water.....	1 ounce.

Keep the solution in the dark. Or, dust into the eye some of the following powder: finely pulverized Boracic Acid and Calomel, equal parts; blow in gently from a paper cylinder. If eye is very cloudy and the foregoing does not clear it up, use Nitrate of Silver, 5 grains, to an ounce of water, dropping 10 to 15 drops into the eye, three times a day. A few drops of the following mixture:

Fluid Extract of Belladonna.....	1 teaspoonful,
Water.....	2 ounces,

Dropped into the eye will also help to relieve. In mild cases, and if the animal is to be worked, shade the eye by fastening a piece of cloth to the blinder of the bridle.

If it becomes difficult to remove a foreign body, deaden the sensation of the eye by dropping into it 10 to 20 drops of a 5 per cent. solution of Cocaine; have a druggist make up the solution. Give laxative diet, and a teaspoonful of Saltpeter three times a day.

MOON BLINDNESS, OR PEROIDIC OPHTHALMIA.—This is an inflammation of the inner structures of the eye. It is said to be quite common in the West. It is hereditary, being transmitted by either of the parents.

Causes.—The exact cause of the disease is not known. As stated above, it is transmissible from either of the parents. Extremes of heat and cold, dark, damp stables, and unwholesome food, are contributary causes.

Symptoms.—These vary according to severity of attack, but are well marked, and with history, little trouble is had in determining case. There is swelling of the whole eye, and the eyeball becomes hard from effusion into its cavity. Eye is closed, or nearly so, from the light, tears run down the cheeks, and membranes become very red. In first attacks, symptoms resemble very closely those of simple ophthalmia. As a result of inflammation, pus is formed in the anterior chamber, and may be seen as a whitish substance down in the lower portion. After a few days the inflammation subsides, and leaves the eye nearly as bright as natural, but if examined closely after a few attacks, shreds of lymph will be seen hanging around in the anterior chamber, especially at the bottom, and the pupil is ragged. In from four weeks to three or four months the trouble will recur, and will be repeated again and again until blindness results. Each attack leaves the eye less bright, and pupil more ragged. May effect one or both eyes.

TREATMENT.—

This is not satisfactory, as the cases result finally in total blindness, but the disease may be kept back by following the treatment as given in "Simple Ophthalmia." Animals thus affected should never be used for breeding.

INFLAMMATION OF THE IRIS—IRITIS.—This is an inflammation of that portion of the eye surrounding the pupil and giving the color to the eye.

Causes.—Severe external violence; extremes of light and darkness; exposure to storms; facing the wind, and constitutional disorders.

Symptoms.—A pink ring is seen around the white, fibrous coat forming the large posterior portion of the eye—the sclerotic—where it unites with the iris. The eye is retracted and partly closed; the haw is drawn up; the conjunctiva is inflamed; the pupil is very small, and the aqueous humor becomes turbid, with white flakes floating in the anterior chamber, and usually a little pus at the bottom of the latter.

TREATMENT.—

Place the horse in a dark stall, and hang a cloth over affected eye or eyes when cold pack is not used. If in good condition, give a 4-drachm dose of Barbadoes Aloes, and if there is any reason to suspect a rheumatic origin, give:

Fluid Extract of Colchicum Seed.... ½ drachm,
Salol ..... 1 or 2 drachms,
Two or three times a day.

Apply to the eye the lotions recommended for "Simple Ophthalmia," and also apply the cold pack. Use the Belladonna lotion. Give light laxative diet and a teaspoonful of Saltpeter three times a day.

INFLAMMATION OF THE HAW OF THE EYE—This is an inflammation of the cartilage (Membrana Nicitans) in the inner corner of the eye.

Causes.—From chaff or other foreign substance getting into the eye and setting up an irritation.

Symptoms.—The haw, which in normal conditions is only a small part visible, becomes by inflammation enlarged and spread over a large part of the eye.

TREATMENT.—

Examine eye, and if any foreign substance is found remove it, and give treatment as for "Simple Ophthalmia." Sometimes this membrane is attacked by cancerous formations, in which case, touch the growths with a Lunar Caustic pencil, and if this does not destroy growth it will be necessary to remove the haw; but this membrane was put in the eye for the purpose of protection and should not be cut away unless absolutely necessary. When

this is necessary, the Cocaine solution should be used; the horse secured, the eye held open and the haw seized by forceps, drawn out from the eye, and cut off with blunt-pointed scissors. There is but little bleeding and no pain if Cocaine is used. The operation should be performed by a veterinarian.

CATARACT OF THE EYE.—This is a turning white of a structure of the eye known as the crystalline lens.

Causes.—From repeated attacks of inflammation, or may be present at birth. May develop and one not be able to assign cause.

Symptoms.—Usually the pupil is much dilated; back of it is seen a white body—the opaque lens. The condition comes on more or less gradual, and at first a close examination may be necessary. Examine first in strong sunlight, and note degree of contraction of pupil—should be small; then place in a dark stall and examine with a candle. The healthy eye reflects three candles—one from the cornea, the second from the lens, the third from back of lens. When either of last two are blurred or wanting, no further proof is needed.

TREATMENT.—

Is unsuccessful. In early stage may be treated as for "Simple Ophthalmia."

STAR GAZER—GUTTA SERENA, OR GLASS EYE—AMAUROSIS.—This is paralysis of the optic nerve and retina. The latter is the expansion of the optic nerve over the back chamber of the eye.

Causes.—Tumors or other diseases of the brain implicating the roots of the optic nerve; injury to the nerve between the brain and eye; inflammation of the optic nerve within the eye, or undue pressure on the same from dropsical or inflammatory effusion. It may also occur from an overloaded stomach, from profuse bleeding, and even from the pressure of the heavy womb in gestation.

Symptoms.—There is a wide dilation of the pupil, so as to show fully the interior of the eye, the expansion remaining the same in light or darkness. In ordinary eyes, the pupils, when

brought to the light, contract, and then dilate and contract alternately until adapted to the light. The horse does not dodge when a motion is made as though to strike him, unless hand causes a current of air. The ears are held erect and turn quickly toward any sound, and horse steps high to avoid stumbling over objects he cannot see.

TREATMENT.—

This is only useful when disease is a symptom of some curable cause, like congested brain, loaded stomach, or heavy womb. When recovery does not follow termination of these conditions, give 1 drachm doses of Nux Vomica daily. Probably incurable.

FILARIA OCULI, OR WORM IN THE EYE.—This is a small, thread-like worm, which can be plainly seen floating about in the aqueous humor, in the anterior chamber of the eye. It is from a half to two inches in length. It is probably taken into the system in the form of egg or larva, with food or water, especially the latter, works its way into the circulation and finally settles in the eye. It causes inflammation and destruction of the eye, unless removed. A very uncommon condition.

TREATMENT.—

The only remedy is to cast the animal and secure him; Cocaine the eye and then make an incision in the upper border of the cornea, close to the sclerotic or white of the eye, the point of the instrument being pointed forward slightly to avoid injury to the iris. This will evacuate the anterior of the eye, and the worm will come out with the fluid. Then apply cold water and astringent lotions as in "Simple Ophthalmia." Keep the animal quiet after the operation, and put him in a clean, dark, box stall for a few days. This operation should always be performed by a veterinarian.

INVERSION OF THE EYELIDS—ENTROPIUM.—This is an inversion of the eyelids, causing the lashes to turn in upon the eyeballs, and giving rise to irritation. It is due to excessive thickness of the lid above the rim, so that the rim is made to turn in. Result of inflammation, injuries, etc.

TREATMENT.—

This is relieved by cutting out an elliptical section of the skin, the long axis of the ellipse to run lengthwise with the eyelid, and sewing up the wound again to shorten the lid. Afterwards dress wound.

EVERSION OF THE EYELIDS—ECTROPIUM.—This is consequent on an inflamed and thickened lining membrane, causing the lid to turn out. It is most common in the lower lid. It is cured by the removing of a horizontal elliptical section of the lining membrane, and drawing the edges of the wound together to shorten the inner side of the lid. The after treatment is as in "Simple Ophthalmia." The veterinarian should be employed for these operations.

INJURIES TO THE EYELIDS.—The eyelids of horses are frequently torn and injured in various ways. When torn the edges should be brought together as promptly as possible, by sewing them with fine silk, making fine stitches, and dressing two or three times a day with Carbolic lotion. Tie the horse in the center of a wide stall, with a line from each side, so that he cannot rub his head and tear the wound, and feed him from the floor. A twitch on the nose will answer in some cases to hold the animal, but it may be necessary to throw him. The Cocaine solution, as for removing foreign bodies (see in "Simple Ophthalmia"), if used in the injury, will deaden pain and render animal quiet.

INJURIES TO THE DUCTS OF THE EYE.—These are the ducts or tubes that carry the tears from the eyes into the nasal passages. They leave the eye from the bottom of the inner corner. When these become injured or obstructed the tears will flow over the cheek.

Causes.—Injuries to face, growths in the duct, and inflammation of duct extending from nasal cavities.

TREATMENT.—

Examine to see if there is any mechanical obstruction; if so remove same, if possible. A nasal douche, as in "Catarrh,"

may benefit. Bathing the face below the eye, along line of nose, with hot water, may help. Steaming nasal cavities, as in "Catarrh," is another treatment. Rub Tincture of Iodine on the face below the eye, along the line of the nose. Still another plan is to put the point of a small syringe into the small hole found in the bottom part of the nasal passage, and force warm water or astringent washes up through the duct until it comes out at the corner of the eye, or force solution through the duct in the same manner from the eye end of the duct.

CONTAGIOUS DISEASES AND FEVERS OF THE HORSE

HORSE POX—EQUINE VARIOLA.—All animals have a pox peculiar to their kind; the forms seem closely allied. They are all contagious from one animal to another, of the same species, and usually among the different species, to a greater or less extent. Having any of the different kinds of variola once, gives immunity from subsequent attacks of the other kinds, for a number of years, at least. The period of incubation—time after exposure before disease develops—is about ten days.

Causes.—The direct cause of horse pox is infection by communication in some way with animals that have the disease. Colts are particularly susceptible to contagion. It may be carried in the air; harness and blankets used by horses with the disease may also be a means of contagion. A stallion with the disease may, through mares, spread it to many farms. Attendants carry contagion on their clothes and hands, and may get inoculated, which answers for vaccination. This, however, is more severe than when vaccinated with cow pox, and should be avoided.

Symptoms.—There is a slight, sometimes a severe, fever, mucous membranes highly reddened, heat and swelling of affected

parts for a day or two; then hard lumps like shot form, increasing in size to one-half inch in diameter; the hair ruffles up and skin reddens around the pock; on the third to sixth day a limpid, yellowish fluid flows from the pustules, and sticks the hair up in yellowish scabs, or streaks, on the removal of which a red, raw depression is seen with the scab fixed in its center. In three to four days the secretion ceases, pustules dry up, parts heal, and the scab comes off. The eruption may be more or less general, may be confined to softer parts of the body, or about a wound.

TREATMENT.—

Place the horse on a low diet, with little or no grain, give bran mashes, a moderate amount of hay, a few carrots or apples—which will act as a laxative—and sloppy feed. Give water when wanted, but do not have it cold. Give 2-drachm doses of Saltpeter, or 1-ounce doses of Sweet Spirits of Niter, three times a day. If fever is high, give Fluid Extract of Aconite 10 drops, and 1 drachm of Fluid Extract of Belladonna with the Saltpeter. Sulphate of Quinine, in ½-drachm doses, three times a day, is valuable. If trouble with air passages and lungs is threatened, apply a large Mustard plaster to the belly and sides of the chest, and treat as under "Inflammation of Lungs." If the pustules run together—are confluent—apply to them Oxide of Zinc ointment, or White Lotion, and if ulceration is excessive it may have to be touched with Lunar Caustic.

Exercise great care in keeping animal from draughts; blanket or put sheets on the body and bandage the legs. When convalescent, give food easy to digest, walking exercise, and keep bowels free by food or small doses of Glauber's Salts. Animal must be kept from other horses, and all straw and manure burned. Stable must be scrubbed with disinfectants of the most powerful kind, then closed and fumigated by burning sulphur. (See Fumigation, under "Disinfectant.")

GLANDERS AND FARCY.—These are but different names for the same disease, the first being applied to the form where the nasal passages, air tubes and lungs are affected, while farcy is applied to the form that is manifested in the lymphatic glands and other tissues of the legs and body. Glanders covers

all forms in fact, while farcy covers the one. The two forms may exist separately, or both may be found in the same case. The contagion lies in the discharges, either from the nose or from the farcy "buds;" it is contagious only by inoculation or direct contact—the contagion does not pass through the air. The virus of glanders may produce glanders or farcy, or both; and the virus of farcy may do the same.

Causes.—The direct cause is inoculation with the virus from some animal having the disease. Working in harness with a glandered horse, or standing in the stall or rubbing the nose on a hitching post, or fence, or the edge of a water trough where a glandered horse has stood. The latter are common means of infection, for when a glandered horse is driven up to a post or trough, the first thing he does is to wipe off the accumulation of matter from his nose, and this will retain its vitality for a long time. The poison may lie dormant in the system for from a week to two months, and then break out in acute form, causing death in from three to six weeks, or it may appear in a mild and chronic form, the horse living and sowing seeds of trouble for others for from one to four years. Unscrupulous dealers sometimes traffic in glandered animals, explaining that the running nose is "only a cold," and the swollen legs "bad blood," thus aiding the spread of the disease. The disease is said to sometimes arise spontaneously in armies, on shipboard, and in damp, badly-ventilated stables, but it cannot develop except as the virus is introduced in some manner.

Symptoms.—Acute glanders is characterized by languor; dry, staring coat; red, weeping eyes; loss of appetite; quick pulse; elevated temperature, the thermometer showing 103 to 105; accelerated breathing; gray purple color of the lining of the nose; a watery discharge which soon becomes yellowish and sticky, causing the hair on which the matter accumulates, in and around the nostrils, to stick together. Discharge looks like melted butter, and sinks when dropped into water. Glands under the jaw swell, are rough and often adhere to the bone, but not always; nasal partition becomes ulcerated—small yellow points, with purple bases, will come up and burst, making discharge bloody for the

time. These ulcers, with depressed centers, will spread and run together, producing a ragged sore; the discharge increases; the lungs may become affected by ulcers forming in them; breathing becomes labored, and finally death ensues.

In the chronic form, the course is much longer, and toward the last all the symptoms are observed in the modified form. At first the symptoms may pass unnoticed. The appetite is less impaired until near the last; discharge less copious, and emaciation takes place more slowly. Should the horse be exposed at any time to hardship or storms, the chronic may run into the acute form. Cough is not always noticed, and ulcers may be so far up the nose as to be out of sight. Sometimes it is necessary to inoculate a worthless animal, or some small, susceptible animal, in order to determine the disease, which, if glanders, will run its course in inoculated animals in from two to three weeks; or, the suspected is tested with mallein.

Farcy is recognized by the swelling of the lymphatics affected; this occurring along the line of the lymphatics, on the inside of the legs, belly, or any part of the body; small, nodular points come up, which break and discharge a glairy, unhealthy pus; run a few days, dry up and leave a scar or bare spot that is permanent. Other "buds" or "buttons" follow in the same course. Swelling of limbs does not yield to treatment, and they become chronically enlarged. Discharge is contagious, the same as from nose. Farcy sooner or later runs into glanders and terminates in death. Summing up the essential symptoms of farcy, they are: the nodules, or buds or buttons, as they are called, which form under the skin, varying from the size of a bullet to that of a walnut, forming most often on the sides of the lips and neck, lower part of shoulders, inside of thighs, or the outside of the legs; the ulcers formed by the breaking of the buttons, heal slowly, sometimes not at all; the discharge from the ulcers, and the cords formed by swelling and hardening of the lymphatic vessels.

Glanders, in some respects, resembles chronic catarrh, and may be mistaken for it, and catarrh is sometimes mistaken for glanders. A discharge from the nostril, the result of diseased teeth, has also been mistaken for the discharge of glanders, and the horse killed. In all doubtful cases, the horse should be

tested with mallein. This is the poison produced by the germ causing the disease, and is obtained by cultivating the germs artificially. To test the horse, the temperature is taken five or six times during the day, and at nine or ten o'clock at night a little of the mallein is injected underneath the skin in the region of the neck; about eight hours after the injection, the temperature is again taken, and the taking repeated each hour throughout the day. If the temperature rises two or more degrees higher after injection than before, the disease is pronounced glanders. If the disease is not glanders, the temperature ought not to rise any higher after than before injection. If the animal is affected with glanders, there will also be a larger and sorer tumor at the point of injection than when not glandered. A veterinarian should always apply the test.

TREATMENT.—

No remedies have yet been found that are of any avail whatever. This, added to the fact that the contagion is conveyable to man in a very fatal form, adds a still more serious aspect. The animal should be destroyed, buried deeply or burned, and the stable, harness and everything used about the horse disinfected.

STRANGLES OR DISTEMPER — COLT-ILL — CATARRHAL FEVER.—This is an infectious disease of horse, mule or ass. It is most frequently seen in young animals, and usually leaves an animal who has had an attack free from future trouble of the kind; generally more severe with older animals. It appears as a fever, which lasts for a few days, with frequently the formation of abscesses on any part of the body, but particularly around the throat. Sometimes there are no abscesses, and the fever remains diffused through the system. In case abscesses form elsewhere than around the throat, or where there are no abscesses, it is called "Bastard Strangles." Period of incubation, five to eight days. Course of disease about nine to twelve days.

Causes.—It is thought sometimes that it arises spontaneously from the existence in the system of some morbid matter developed while growing, for this kind is only found among young horses;

but the principal source of contagion is by infection. It is probably a germ disease, although no specific germ has ever been isolated.

Symptoms.—Horse at first is sluggish if used, or when placed in stable, and pays little attention to surroundings; appetite is variable; thirst is increased, but drinks oftener rather than more at a time, and when drinking water comes back through nose; coat becomes dry and staring. At times there are chills in one or more members, or in severe cases all over the body, with trembling of muscles, dryness of skin, and hairs on end. Membranes of mouth are of a bright rosy color; pulse quickened, temperature rises, and breathing may be slightly accelerated. At the end of a couple of days there is a cough and nasal discharge, which at first is watery, but later thicker, bluish in tinge, and finally yellowish, like matter, and increases in quantity. The cough, which at first is repeated and harsh, becomes softer as discharge increases, but varies according to source of discharge. Shortly after discharge, a swelling takes place under the jaw or about the throat. Sometimes this is very large, and if about the throat, head is carried out. Swelling at first is puffy, somewhat hot and tender, and finally becomes distinctly so, and an abscess is felt, or having broken, discharge is seen dripping from small opening. When swellings come in the lungs, the breathing is affected, with symptoms of pneumonia. If in the abdomen, there will be colic pains, and he will lie down more or less of the time. Sometimes it comes around the heart. Any of the unusual forms are likely to be fatal.

TREATMENT.—

Ordinarily, mild cases require little treatment beyond a teaspoonful of Saltpeter and a teaspoonful of Fluid Extract of Belladonna, three times a day, along with diet, warm mashes, moistened hay, warm coverings, and protection from exposure to cold. The latter must be rigidly observed, as lung troubles, bronchitis, and laryngitis are often the result of neglect. If the case is more severe, give the treatment as for "Laryngitis." Steam the head. Give the medicines in form of a paste if the throat is sore, as it generally is. Poultice the swellings with

Flaxseed poultices, and when they point, open, or let them break, and then flush out with Carbolic Acid solution. Prompt action may save serious consequences. When lung complications show themselves, apply Mustard plaster to belly and sides of the chest, and treat as for "Inflammation of the Lungs." When convalescence begins, be careful about exposure to cold, and go slow about putting animal to anything like hard work.

The disease is sometimes followed by an unthrifty condition, swelling of sheath, legs and underside of belly. In such cases, give:

Tincture of Iron	½ ounce,
Quinine	½ drachm,
Water	½ pint,

Three times a day, in addition to the other treatment. Ounce doses of Hyposulphite of Soda are also good in these cases.

INFLUENZA—PINK-EYE—EPIZOÖTIC.—This is a specific, contagious, and infectious fever of the horse, ass, and mule. It is attended with changes in the blood, stupefaction of the brain and nervous system, depression of the vital forces, and frequently inflammatory complications of the lungs, intestines, or other parts of the body. Young horses are more subject to the disease than older ones, and one attack usually makes the animal immune.

Causes.—Infection is the direct cause of the disease. The germs may be carried through the air to a considerable distance, but the bedding, and droppings of sick animals, may convey the disease to others, if exposed to them. Drinking troughs, and even running water may be a means of spreading disease, while attendants of sick animals carry the infection in their clothing. From unknown causes the disease may assume an epizoötic form, affecting a very large number of animals, as in 1872 and 1878.

Symptoms.—The time of incubation is from five to seven days, during which time the horse seems in good health. The first symptoms are those of rapidly developing fever, which quickly becomes intense; animal is dull and inattentive; stands with head down and back on halter, as in serious lung troubles; has chills, and frequently grinding of the teeth, which indicates

a severe attack. The hair becomes dry and staring, and fever ranges high. Horse becomes stupid and immobile; hangs his head; ears drooping, and not easy to arouse. Eyes are swollen, sometimes entirely closed, and tears run down the cheeks, in some cases blistering them. Breathing is quickened to 25 or 30, and pulse to 70, 80 and even 100 a minute. Great depression of muscular force ensues, and horse stands limp, as if used up. If moved seems weak, sometimes almost staggering. The visible membranes, as of the eye, from which it took the name "Pink-eye," and the mouth and natural openings, become of a deep saffron, ochre, or violet red color. There is a great diminution of appetite, or total loss, with an excessive thirst. Following fever there is apt to be swelling of the sub-cutaneous tissues at the fetlocks, of belly, of the sheath of the penis, which may be tremendous. In ordinary cases the fever has reached its heighth, 105 to 107, in twenty-four to forty-eight hours, and so continues for from three to four days. At the termination of the course of the disease—about three days—the fever diminishes almost as rapidly as it began, attended by a diminution of all the unfavorable symptoms, with rapid gain in weight and strength. For the first three days of high temperature there is a great tendency to constipation, which should be avoided, if possible, for if marked, may be followed by a troublesome diarrhea. The termination of influenza may be death, due to extreme fever, with failure of heart's action; from coma, due to congestion of the brain; from blood poison; from suffocation, following congestion of the lungs; or disease terminates in rapid recovery to health; or, in too large a percentage of cases, the course of the disease is complicated with local inflammatory troubles, as the lung disorders, whose gravity is greater in influenza than when occurring separately.

TREATMENT.—

When symptoms are first noticed, lay the horse up at once. See that the stable is clean, dry and well aired, but free from drafts; blanket body and bandage the legs; give soft food to eat, if horse desires food, and if appetite is poor, try a little oats, carrots, apples and the like, grass if in season. Give animal to drink

of cold water in small quantities, but often. If seen during chill, give 1 ounce of Alcohol in a little water and repeat every hour until chill is off.

After the chill is over, give the following:

Fluid Extract of Aconite	1 drachm.
Fluid Extract of Belladonna	1 ounce.
Alcohol	8 ounces.
Saltpeter	2 "
Water to make	1 pint.

Shake. Dose, 2 ounces, four times a day.

Also give ½-drachm doses of Quinine three or four times a day. If the fever runs high give:

Acetanilid	1 drachm,
Alcohol	1 ounce,
Water	½ pint,

Two or three times, as indicated by temperature.

After two days, use the following in place of the first mixture:

Fluid Extract of Digitalis	½ ounce.
Fluid Extract of Belladonna	½ "
Alcohol	6 ounces.
Saltpeter	1½ "
Water to make	1 pint.

Dose: 2 ounces, four times a day.

If heart shows weakness, give 1 or 2 grains of Strychnine three or four times a day in addition to the above. If complications ensue, treat as for that disease. After animal commences to recover, give tonics as for "Chronic Indigestion," and put to work gradually after thoroughly recovered. If eyes are badly inflamed, treat as for "Ophthalmia." If there is constipation, give one pint doses of raw Linseed Oil daily, and injections per rectum. Three or 4-ounce doses of Epsom Salts may be used in place of the oil.

SCALMA.—This is an infectious disease of the horse, attended with fever and complications of the bronchial tubes, the windpipe, and the larynx, which are shown by the cough

attending. It is similar to "Whooping Cough" in man. It occurs often as a stable plague. It is rarely fatal, except from complication of pleurisy or excessive spasms of coughing. The period of incubation is six to seven days, but may develop in two or run on to ten days. Contagion may spread by actual contact, as standing in stall where a horse with disease has stood, or it may be taken in the air, several stalls distant. One attack is usually protective.

Symptoms.—The disease is ushered in by fever, which reaches a high temperature, but not corresponding acceleration of breathing and pulse. With fever there is developed a diffuse bronchitis, which is sub-acute in character and course. The windpipe, larnyx, pharynx and even nasal passages may be involved. In two or three days, a grayish discharge occurs from the nostrils, which, in variable quantity, may last for from eight to fourteen days, or even twenty-one days. The cough is short, rough and painful, spasmodic in its occurrence and in character. The slight watery or slimy nasal discharge may become more profuse, purulent, or even "rusty," if the bronchitis has extended to the neighboring structure. Pulse and breathing, usually but little quickened, unless from complication or coughing. Temperature rises rapidly and attains sometimes 107½, but not often. In two or three days after cough sets in, temperature usually drops. The hide is dry and rough, but horse looks "out of condition" rather than sick; emaciation is rapid; mucous membranes are reddened; appetite diminishes, but animal chews constantly; eating or drinking cause frequent fits of coughing. Percussion on chest shows no changes, but mucus rales are heard, and at times tubular breathing. Throughout the course of the disease we have one constant symptom—nervous irritability. Horse flinches when touched on the loins, even at high fever temperatures, stands with head up from entrance of anyone in the stall; will bite and strike at first touch, rear, back, and sometimes break his halter. Course of disease is five to eight days, but cough may continue two or three weeks with variable temperature. In recovery the temperature drops, cough becomes less frequent, less spasmodic, and appetite returns.

TREATMENT.—

The treatment where there are a number of horses should be first, preventive. Infected animal should be removed and complete disinfection follow. The individual treatment should be simple. Put horse in large, clean stall, with fresh air without drafts, give frequent rubbings and blanket warmly, and tempting food to keep up appetite. Regulate the digestive tract with small doses of raw Linseed Oil—a pint once a day—and give the same prescription as in the previous disorder. When cough is excessive, give Camphor, 2 drachms, and Chloride of Ammonia, 2 drachms, three times a day. Steaming the head is good for the cough. One-half drachm doses of Quinine, three times a day, is valuable. If any of the lung disorders develop, treat accordingly.

DISEASES OF THE SKIN

CRACKED HEELS OR SCRATCHES.—These are simply chaps and cracks around the heels and at the back of the pastern; corresponding to chapped hands in man. Usually they are simple, but sometimes stubborn, requiring time and perseverance for their cure.

Causes.—Exposure to cold, mud, snow, slush and ice-water, without proper care in Fall, Winter, and Spring; washing and not properly drying the skin; standing in dirty stables in contact with dung and urine; or anything that will tend to irritate the skin. Hairy, round-legged horses are more subject to the disease than light ones.

Symptoms.—The skin is swollen in the hollow of the pastern, accompanied with transverse cracks; sometimes there are numerous small ones, again fewer large ones. When dry, they will be hot, sore to touch, and painful. When the rear limbs are affected, sometimes the bending will cause the horse to raise the feet a couple of feet high at first, but with exercise, the soreness partially disappears.

TREATMENT.—

Remove the cause if possible. If there is much heat and inflammation, give a laxative of 5 drachms of Aloes, or ½ pound of Glauber Salts, and follow with a teaspoonful of Saltpeter three times a day. If horse has been overfed with grain, reduce same, or replace with bran mashes, Flaxseed and other laxative food. If debilitated, give nutritious food and a good tonic. When horse comes in, wipe off parts as clean as possible and apply White Lotion:

Acetate of Lead	2 ounces.
Sulphate of Zinc	1½ "
Carbolic Acid	1 ounce.
Water	1 quart.

Shake.

One-half the water in the lotion can be replaced with Witch Hazel to good advantage. If the part is highly inflamed, foment and poultice a portion of the time. If cracks get dry, apply a little melted lard.

The front of the hocks and the back of the knees are sometimes affected with a condition similar to "Scratches." and while these conditions receive different names, the treatment is exactly as for "Scratches."

GREASE HEEL.—This is a name given to a disease which affects the back of the fetlock and the part immediately above. It is inflammation of the skin involving the oil glands; generally confined to the long hair known as the "Feather." The name is given on account of the discharge, which is profuse and greasy in appearance, and has a very offensive smell.

Causes.—Scratches when neglected may run into grease heel; filth is also an exciting cause; high feeding with light exercise is a predisposing cause. Generally confined to the draft horse, and to those having a tendency to the thick, round legs.

Symptoms.—The affected leg is swollen at the fetlock; if the part is handled it is found to be hot and sore, the animal picking the limb up very high. In severe cases there will be elevation of the temperature and accelerated pulse. After a day or two

there is an offensive, oily discharge from the part. In the more severe cases the animal is lame. If the horse is moved much there will form large transverse cracks above the fetlock, in which "proud flesh" is apt to develop, called "grapes." The part itches more or less. Sometimes in mild cases there is little more than a scurfy condition of the skin, with the dropping of some of the long hair. The disease is apt to leave scars and an enlarged leg unless properly treated.

TREATMENT.—

Give a dose of Aloes—8 drachms—and feed on soft feed for a few days. Also give 1 teaspoonful of Saltpeter and ½ teaspoonful of Fluid Extract of Colchicum Seed three times a day. Locally apply hot fomentations to the leg during the day, and poultice at night. Use Carbolic Acid water for making the poultice, and put some charcoal in it. Bathe the part well two or three times a day with the following:

Acetate of Lead	2 ounces.
Sulphate of Zinc	1½ "
Witch Hazel	1 pint.
Water	1 "

If the proud flesh starts, destroy by dusting onto it burned Alum or Sulphate of Zinc. If the part gets dry, grease well with melted lard. After the inflammation subsides, if some of the swelling still remains, exercise the horse to take it down, and then handrub and apply a thick cold bandage, applying fresh water every half hour. Exercise twice a day. Enlargements that have existed for some time cannot be removed. During the acute stage of the disease keep the horse quiet, as moving causes the part to crack more.

MUD FEVER.—This is inflammation in the skin of the legs, from the feet to the knees and the hocks. The skin is covered with scabs as though blistered, and when they come off the hair usually comes off with them, leaving the legs bare.

Cause.—Chilling of the skin by standing or working in cold mud and ice-water. The skin becomes thoroughly chilled, almost like frost-bitten, and when warmed the reaction is so great as to

produce much inflammation, which leads to the conditions spoken of above, and sometimes to boils or furuncles. It is most common on limestone roads, the soil being irritating. The condition of the animal is a predisposing cause.

Symptoms.—There is swelling of the legs. After exposure for a day or more to cold, wet mud, or ice-water, they will be found very hot and sore the next morning. In a few days the hair will be filled with scabs that cling tightly to the skin, which after a few days more, will loosen and come off, bringing the hair with them, and leave the legs entirely bare in some instances. There is usually more or less general fever, with rheumatic tendency. There is a stiffness when the animal is moved.

TREATMENT.—

If a severe case, leave the animal in the barn for a few days. Foment the legs by putting a heavy bandage around them and keeping it wet with hot water; re-apply water every half hour. Bathe two or three times a day with lotion as for "Grease Heel." Give the same internal treatment as for "Grease Heel." This is very important. When the inflammation subsides and the swelling commences to go out, keep greased well with melted lard. If animal is unthrifty, follow with tonics as for "Chronic Indigestion."

ECZEMA.—This disease is sometimes confused with mange, but the nature is quite different, as mange is caused by a parasite working in the skin, while eczema is not, it being a congestion of the skin, with a thick crop of little blisters, formed by effusions of a straw-colored fluid between the true skin and the cuticle, or outer layer.

Causes.—Indigestion, and the presence of irritant matter in the blood and sweat; high feeding with light exercise. The excitement in the skin, caused by the shedding of the coat, lack of grooming, hot weather, hot, boiled, or steamed foods, are conducive to the eruption. Lastly, any change of food may cause it.

Symptoms.—First, there is a dryness of the skin on the lower part of the limbs, around the head, neck, on the back and hips;

then little pimples form, varying in size from a millet seed to that of a pea, which break and allow the escape of a fluid, which forms as a slightly yellowish scab or crust around the roots of the hairs. When the scabs are removed a little of the hair comes with them. It is apt to create much itching.

TREATMENT.—

This disease is so often the result of indigestion that a laxative should be given—¾ pound of Epsom Salts in three or four quarts of water, or 1 quart of raw Linseed Oil, or, if the animal is fat, give an ounce of Aloes. Feed very lightly on laxative food, bran, scalded oats, roots, and a little hay. Also give a teaspoonful of Saltpeter, and a half teaspoonful of Fluid Extract of Colchicum Seed three times a day. Keep the bowels active by repeated doses of oil, if necessary. After continuing the treatment for a week, put the animal on the tonics, as for "Chronic Indigestion." Treatment may have to be continued for some time. Drachm doses of Sulphur two or three times a day are beneficial.

As a wash to stop the itching, use cooking Soda, 1 to 2 ounces; water, 1 quart; or Salt, 1 handful; water, 1 gallon; or Sulphuric Acid, 1 drachm; water, 1 pint. As scabs form, soften and remove them, and apply a little Carbolic Acid solution.

NETTLE-RASH—SURFEIT—URTICARIA.—This is an eruption in the skin in the form of nodules or lumps, in size from a hazel nut to that of a hickory nut, with little disposition to the formation of either blister or pustule. It is an effort on the part of nature to throw off some impurities of the blood. The body gets fat, the blood rich, liver and kidneys become inactive, and the skin takes on too large a contract. It is most common in the spring, and among good feeders.

Causes.—Are shedding of coat; changes of weather; unwholesomeness or sudden changes in the food. Too high feeding, especially with corn.

Symptoms.—Generally comes on when animal is warmed up. There is swelling that embraces the entire thickness of the skin, and terminates by an abrupt margin, in place of shading off into

surrounding parts. When the swellings run together, they form large patches of thickened skin. These may appear on any part of the body, most common on neck, shoulders and sides; the eyelids may be closed; lips immovable, or nostrils so thickened that breathing is difficult, and snuffling; there may be constipation, or diarrhea, or colicky pains. Eruption is sudden, the whole skin being covered in a few hours, and it may disappear as quickly, or persist for six to eight days.

TREATMENT.—

Clear the bowels by an 8-drachm dose of Barbadoes Aloes, or by ¾ pound of Epsom Salts, and follow the operation with daily doses of ½ pint of raw Linseed Oil, and an ounce or two of Epsom Salts. Follow with the same treatment as for "Eczema."

WARTS.—Warts are thickenings, or growths of the skin. They are mostly seen in young horses, about the lips, eyelids, cheeks, ears, beneath the belly, and on the sheath, but may appear anywhere.

TREATMENT.—

The smaller ones may be cut off with scissors and the raw spot cauterized with a little Lunar Caustic. The larger ones may be cut off with a sharp knife, or if with a narrow neck, they may be twisted off and the wound cauterized. Another way is to strangle them by a cord tied around the neck, at least three turns being made around, and the ends fixed by passing them beneath the last preceding turn of cord, so that they can be tightened daily, as they slack by shrinking of the tissues. If neck is too broad, they may be transfixed by a double-threaded needle and then tied in sections. Very broad warts that cannot be treated in this way, best be removed by applying a caustic. Strong Acetic Acid is as good as anything. Moisten the wart freely with the acid, which will kill the outer portion and after a few days the scab can be removed; apply the acid again and another layer is destroyed. In this manner the entire wart can eventually be removed.

MELANOSIS—BLACK PIGMENT TUMORS.—These are common in gray or white horses, on the naturally black

parts of the skin, at the roots of the tail, around the anus, vulva, udder, sheath, eyelids, and lips. They may also form in the lungs, liver, and the muscular tissues, but these latter are not discoverable during life. They may appear as pea-like masses, or as multiple tumors, aggregating many pounds, especially around the tail.

Causes.—Unknown.

Symptoms.—Are the presence of black tumors that form under the skin but show through quite distinctly. Usually flat and irregularly round, varying greatly in size as above stated. Nasty, disagreeable sores often form around them. They commence to appear as animal commences to get whiter; are made up of the coloring matter of the skin.

TREATMENT.—

As long as they do not interfere with animal, the best way, perhaps, is to let them alone. Some, however, recommend to cut them out when they first make their appearance, as it can then be done with perfect safety. Monsell's Solution of Iron can be used to prevent bleeding. Sometimes they may be corded the same as directed to remove warts. If sores form, clean them out and dress with the Carbolic Acid lotion as for "Abscesses." Use Tincture of Iodine in the sores. Sometimes the tumors develop rapidly and render the animal of little value in the course of three or four years, and again they will grow very slowly, never causing any serious inconvenience.

MANGE.—This is a disease that is due to a class of insects called mites, of which there are three kinds that trouble the horse. One of them burrows in the deeper layers and cracks of the skin, while the others live on the surface under the scabs, where, of course, they are more easily got at than the former, and hence less difficult to treat. Mange is contagious by actual contact.

Symptoms.—There is incessant, intolerable, and increasing itching of some part of the skin—head, tail, back, etc.—the horse

inclining himself toward the hand that scratches him, and moving his lips, as if himself scratching. The hairs may be broken and rubbed off, and some come out, but the part is never bald, as in ringworm. Scabs of any thickness may form, but the special features are the intense itching, and the discovery of the mites. In fields, posts, trees, and fences will show the industry in scratching of the horse that has the disease, and as the mites possess considerable vitality, other horses, by contact, may contract the disease sometime after. To detect the mites, scrape off some of the scales and examine with a small magnifying glass.

TREATMENT.—

Remove scabs with soap-suds, using a brush if necessary. Then apply thoroughly a wash, made by boiling 1 ounce of tobacco, and 1 ounce of Sulphur, in 1 quart of water. This may be applied more than once, and should always be repeated after ten to twelve days, to destroy new brood that may have hatched in the interval. All harness, and stable utensils should be treated the same; blankets may be boiled, and the stalls treated with a whitewash of quicklime, containing ¼ pound of Chloride of Lime to the gallon.

Solutions of various coal tar products on the market are good, as Zenoleum, Kreso, etc. Use 1 part to 30 parts of water. The same applications as are used for "Scab" in sheep will be effectual with the horse. If animal is unthrifty, follow treatment with the digestive tonic. See "Chronic Indigestion."

RING-WORM.—This is a fungus, vegetable, parasite, being especially common in young horses coming into training and work; in low-conditioned colts in winter and spring after confinement indoors, and during the shedding of the coat. Horses of lymphatic temperament are more subject to it than nervous ones.

Causes.—Contagion is the direct cause usually, but it sometimes seems to arise spontaneously from horses being poorly kept, and from filth.

Symptoms.—There is a formation of a circular, scurvy patch, where the fungus has established itself, the hairs of the affected

spot being erect, bristly, twisted, broken, or split up and dropping off. Later the spot first affected becomes entirely bald, and a circular row of hairs around this are bristly, broken, and split. These in turn are shed and a new row outside passes through the same process, so that extension is made in a more or less circular form. The central bald spot, covered with a grayish scurf and surrounded by a circle of broken and split hairs, is characteristic.

There is another kind of ring-worm called "favus, or honeycomb" ring-worm. It shows the same general appearance as the other, except that a scab forms in the center after the ring has receded. Treatment is the same.

TREATMENT.—

Clip off the hair around the affected part and paint with Tincture of Iodine twice a day for two weeks, or apply crude petroleum in the same way. Or, wash with soap and water and apply:

Corrosive Sublimate.....	20 grains.
Water.....	1 pint.

Mix.

Repeat once a day until cured. Clean and whitewash stalls, wash harness, and then apply a solution of Carbolic Acid. Brushes and horse clothing must also be thoroughly cleansed by Carbolic Acid solution, or by boiling.

HIDE-BOUND.—This is not a disease of itself, but rather an effect of some derangement of the system that interferes with the general health and gives rise to a generally unthrifty condition.

Causes.—Indigestion, which in turn may be caused by any of the causes which produce it.

Symptoms.—The skin is as tight on the body as a glove is on the hand, and the hair all stands the wrong way—a staring coat, as it is termed. Horse is usually thin; hair is dry, and skin is harsh and dirty.

TREATMENT.—

Give the digestive tonics as for "Chronic Indigestion." Give better care and feed. If from "Worms," treat accordingly. Give a run at grass if in season. Case may require prolonged treatment.

ITCHY SKIN—PRURIGO.—This is an itchy condition of the skin, all over the body or in patches, that sometimes almost makes a horse frantic. He rubs, scratches, and bites himself continually.

Causes.—It is one form of surfeit, and is caused by a surfeited, heated condition of the body that manifests itself in that way; an extreme sensitiveness of the nerves of the skin.

TREATMENT.—

Give the same treatment as for "Eczema," including the purgative and other internal treatment, and the washes.

If the other lotion fails, prepare the following:

Carbonate of Potash.....	2 drachms.
Cyanide of Potash.....	2 grains.
Water.....	1 quart.

Mix. Apply once daily.

Or, put an ounce of Fluid Extract of Belladonna or 2 ounces of Laudanum in a quart of water and wash the itchy parts.

ITCHY TAIL.—This is an itchy condition of the tail at its origin or dock.

Causes.—Filth, surfeit, worms in the rectum, or some other parasitic disease.

Symptoms.—Horse continually rubs his tail against posts, fences, or anything that he can reach.

TREATMENT.—

Wash the tail well with soap and water once a day, and at each washing, saturate the hair with a strong solution of salt and water, or with cooking Soda and water. If that does not cure, give injections of salt and water, and apply the following lotion to the tail three times daily:

Sugar of Lead.....	1 ounce.
Water.....	1 pint.

Mix.

If this does not cure, give a purgative of Aloes, or Salts, and apply:

Tannic Acid	½ ounce.
Vinegar	1 ounce.
Water	1 quart.

Mix and apply three times daily.

If worms are the cause, treat internally, as for "**Worms**," and also inject into the rectum:

Sulphate of Iron	1 ounce.
Water	2 quarts.

Repeat once a day for a few days,

If unthrifty, give digestive tonics, as in "Chronic Indigestion."

LICE.—Two kinds of lice attack the horse, the skin-perforating and blood-sucking kind, and the broad-headed kind with strong mandibles, that only bites the skin.

Symptoms.—Poor condition; itching; loss of hair are the principal symptoms. Examination and the finding of the lice is the positive one.

TREATMENT.—

Washing the horse with any of the Coal Tar products, as Zenoleum, Kreso, etc., using 1 part of the product to 50 parts of water, is effectual. Creolin Lotion, made by mixing 1 ounce of Creolin with 1 quart of water, and used as a wash, is recommended; or sponge the horse with an infusion made by steeping for two hours 1 pound of tobacco in 6 gallons of water. Kerosene Emulsion is also good. This is made by taking 1 quart of Kerosene Oil, 1 quart of soft water, and 1 pound of soap; dissolve the soap in the water and heat to boiling, remove from the stove and add the oil; mix violently by pumping with a force pump from one pail into another. When well mixed it will form a thick, milky-colored fluid with no particles of free oil. Then add 12 quarts more water, mix a little and it is ready for use. Bathe the horse with the mixture; also go over the harness and the stall.

BOILS—FURUNCLES.—These may appear on any part of the skin, but are especially common on the lower part of the

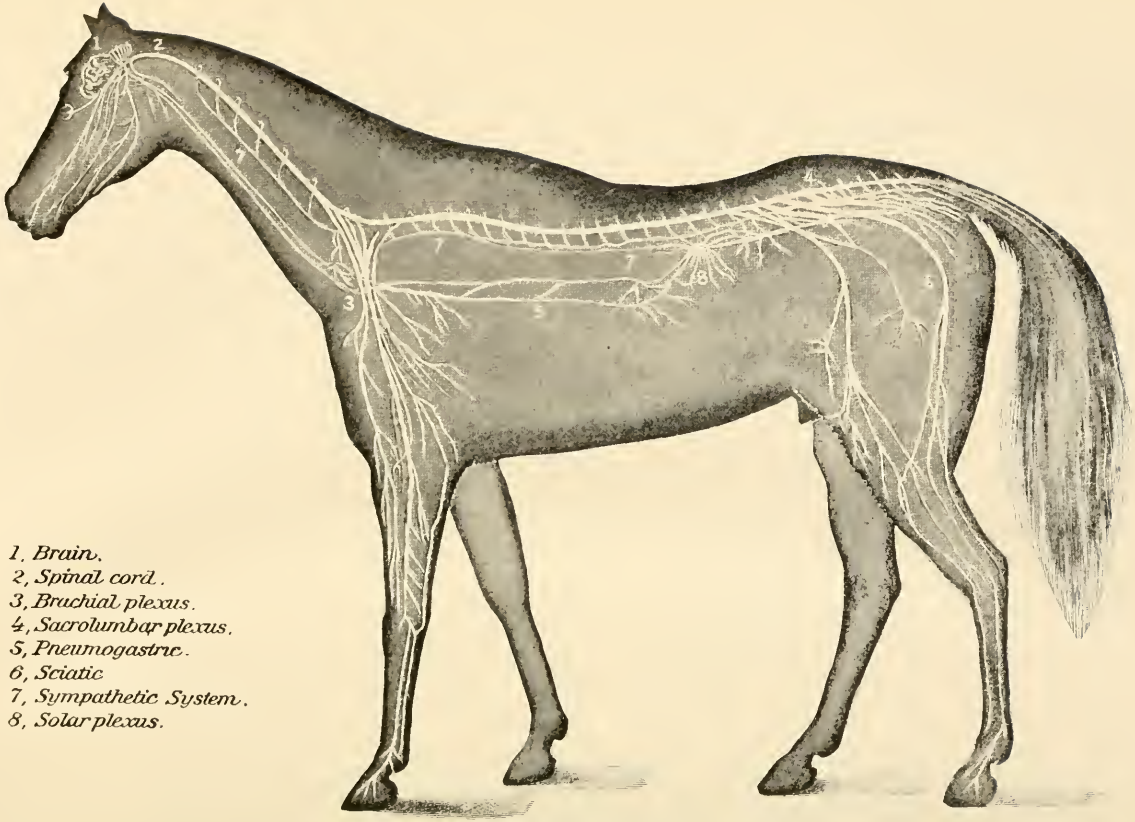
limbs, and on the shoulders and back. When about the feet the latter name is applied.

Causes.—May be constitutional; by irritation of the skin by parts of harness; or is attendant on unwholesome diet and overwork, with loss of general health and condition. May follow weakening diseases, such as strangles or distemper. When about the feet, filth acts as an exciting cause.

Symptoms.—Boils differ from simple pimples, which are individual elevations on the inflamed skin, in that they affect the deepest layers of the true skin, and even layers beneath, and in the death and sloughing out of the central part of the inflamed mass. Again, the depth of the hard, indurated swelling, and the formation of the core, which is bathed in pus and slowly separated from surrounding parts, serve to distinguish the boil from the pustule or pimple, from the farcy bud, and from the superficial abscess.

TREATMENT.—

The incision of very painful boils by a sharp knife or lancet in two directions, followed by a dressing with ½ ounce of Carbolic Acid in a pint of water, bound with cotton wool or lint, may cut them short. Or, apply warm poultices of Linseed meal or wheat bran, and renew daily until the center of the boil softens, when it should be lanced and the core pressed out. Continue poulticing for two or three days and dress with a Carbolic Acid solution. Remove the cause; if poor condition of the system, give tonics. If animal is in good condition, give purgative (an ounce of Aloes, or ¾ pound of Epsom Salts), and follow with smaller doses at intervals of two or three days. Also give a teaspoonful of Saltpeter, and ½ teaspoonful of Fluid Extract of Colchicum Seed, three times a day for a week or two; withhold a week and give again, if necessary; ½-ounce doses of Fowler's solution of Arsenic twice a day is excellent.



1, Brain.
2, Spinal cord.
3, Brachial plexus.
4, Sacrolumbar plexus.
5, Pneumogastric.
6, Sciatic
7, Sympathetic System.
8, Solar plexus.

THE NERVOUS SYSTEM.

DISEASES OF THE BRAIN AND OF THE NERVOUS SYSTEM

INFLAMMATION OF THE BRAIN—PHRENITIS—ENCEPHALITIS—MENINGITIS.—This is an inflammation of the brain and its coverings.

Causes.—Exposure to heat, injuries to the brain from concussion, and from fracture of the cranium, and sometimes as the sequel of other diseases.

Symptoms.—These will vary at the outset, depending as to whether the brain itself or the coverings are more affected. If in coverings, there is a quick pulse, quick breathing, elevated temperature; visible mucous membranes are very red; delirium, horse sometimes being perfectly frantic, dangerous to be around. After a little the symptoms change and we get stupidity; horse places his head against the wall and pushes and braces himself against it, bruising his head more or less; he will eat occasionally, and then doze off into a fit of stupor with his mouth full and let the food drop; when aroused he will move around with an unsteady gait, put his head against the wall and then doze off again. The pulse is now slower than normal, and the breathing is heavy and slow. These symptoms may continue for several days and the animal gradually recovers, or he may die during the early symptoms. Animals that do recover are likely to have recurrence of attack. Young horses are more likely to have the disease than older ones.

TREATMENT.—

It is dangerous in treating an animal during the delirious stage of this disease, and one must use care in going around him. If discovered at the first stage, and it is possible to give the animal medicine, give a physic—1 ounce of Aloes, or ¾ of a pound of Epsom Salts. Also, during the stage of excitement, give ½-ounce doses of Bromide of Potash in a little water; repeat every

two or three hours until quieter, and stop giving when he becomes stupid. Also give the following:

Fluid Extract Aconite	1½ drachm.
Fluid Extract Belladonna	1 ounce.
Saltpeter	2 ounces.
Water to make	1 pint.

Dose: 2 ounces, given four times a day.

After the stupor commences, change to the following:

Fluid Extract of Colchicum Seed	½ ouuce.
Fluid Extract Digitalis	½ ounce.
Fluid Extract of Belladonna	½ ounce.
Alcohol	8 ounces.
Saltpeter	2 "
Water to make	1 pint.

Dose: 2 ounces, four times a day.

In giving, be careful not to choke the animal; if very stupid give one-half the dose twice as often. Apply an ice poultice to the top of the head during the entire course of the disease. To make the poultice, pound up some ice fine, mix with a little bran, put in a small bag and fasten on top of the head; cover with a light blanket and change as often as the ice melts. Give the horse all the water he wishes; and a light, laxative diet, if he wishes food. Keep in a roomy, cool, dark stall. If he gets down, help him up after he has been down a time. Continue treatment until thoroughly recovered. Guard against overheating the animal after an attack of this disease.

INFLAMMATION OF THE BRAIN, SPINAL CORD, AND THEIR COVERINGS — CEREBRO-SPINAL-MENINGITIS. — This may occur sporadically, but usually it occurs as an epidemic in a stable, city or farming district.

Causes.—The cause is not well known, but it is supposed that bad sanitary surroundings and musty feed may act as a cause; and bacteria may at times play a part in causing the disease.

Symptoms.—They vary according to parts most affected. There will be trembling noticed in different parts of the body; animal seems very dull and does not feed. As the disease goes on, there will be a peculiar jerking in the limbs, and then he will

stagger, fall, and be unable to rise; the pulse will be quick and weak; the bowels usually costive, and the urine a dark brown color. At first he lies in a dull, stupid manner, breathing heavy, and sweats freely if it is very warm. After a time the dullness passes off and the horse becomes delirious. Will thrash about, keep the limbs going, especially the front ones, and pound the head in endeavoring to get up. If you offer him water to drink, he will try, but cannot, as there is paralysis of the gullet. These symptoms gradually grow worse until he dies. When one horse is affected with this disease, there are apt to be more, for the same cause which gave it to him will probably produce it in the others

TREATMENT.—

Give a cathartic of 1 ounce of Aloes; and give 1 to 2 drachms of Fluid Extract of Belladonna, alternated every three hours with 10 drops Fluid Extract of Aconite Root. Apply strong liniments or a Mustard paste to spine, neck, and throat. When the animal is unable to swallow, give one-half the dose on the tongue every hour. If animal can swallow during stage of excitement, give ½ ounce of Bromide of Potash every three or four hours. During early stage, while animal is still able to swallow, give 2 ounces Sweet Spirits of Niter, three times a day. Apply an ice poultice to the head as in previous disorder. The disease is very apt to terminate fatally. As a preventive to the other horses, determine cause and remove it.

CONCUSSION OF THE BRAIN.—

Causes.—This is generally caused by the animal falling over backward and striking the back of his head, or perhaps falling forward and striking on his nose; by throwing the head up and striking against a beam, or by a blow on the head in some way.

Symptoms.—There is giddiness, stupor, insensibility, or loss of power succeeding a severe blow on the cranium. Animal may rally soon, or not for hours, but when slight, soon recovers. If more severe, animal may be insensible and lay as in deep sleep; the pupils insensible to light, pulse fluttering or feeble, surface of body cold, muscles relaxed, and breathing scarcely perceptible.

After a variable interval, recovery takes place, which may be followed by paralysis of some parts of the body, often of a limb, the lips, ear, etc. Convalescence is usually tedious, and frequently impairment of some part remains.

TREATMENT.—

Dash cold water on the head and body to arouse heart action. Allow animal to inhale Ammonia vapor. Give frequent injections, by the rectum, of weak Ammonia water, Ginger tea, or Oil and Turpentine. In most cases these means will restore senses. In more severe cases apply Mustard plaster along the spine. When partly conscious give Whiskey in 3 or 4-ounce doses. Owing to severity of injury, or possible rupture of blood vessels, and effusion, inflammation of the brain may ensue, and, if so, must be treated accordingly. For this reason stimulants must not be given too freely, and must be stopped as soon as reaction is restored. As a preventive against inflammation, cold applications can be made to the head for a few days; a physic in the form of ¾ pound of Epsom Salts may be given, and also a teaspoonful of Saltpeter three times a day.

VERTIGO—CONGESTION OF THE BRAIN.—This is an accumulation of blood in the vessels of the brain. It may be either passive or active—active when there is an undue rush of blood to the head, or passive when the blood accumulates because of some resistance to its return through the veins.

Causes— Active congestion may be due to heart trouble, excessive exertion, influence of extreme heat, sudden and great excitement, artificial stimulants, etc. Passive may be caused by mechanical obstruction to return of blood, such as a small or ill-fitting collar, tumors or abscesses pressing on the vein, or an organic heart trouble. Extremely fat animals are most subject to this disease. Sometimes induced by digestive disorders.

Symptoms.—The animal stops suddenly, throws up his head, shivers all over, staggers, and may plunge, run a ways and fall, or may fall almost immediately. The eyes are staring, breath hurried and snoring, and nostrils dilated. He may stand with legs braced and not fall, and after a few minutes, shake himself

and go on as though nothing had occurred. Again, he may be giddy and weak for several days. If due to organic changes in the heart, or disease of the blood vessels of the brain, then the symptoms may be of slow development, and show drowsiness, dim or imperfect sight, difficulty of movement, loss of feeling and consciousness, stupor and death.

TREATMENT.—

If animal falls, loosen the collar if it is the cause, and then dash cold water on the head. The congestion will be relieved in a short time and consciousness will return. Endeavor to determine cause and remove it, to prevent a recurrence. Some animals are subject to attacks, which cannot be prevented. If the animal is violent during the attacks he should be destroyed, as he is dangerous. If the attacks are infrequent and animal is not violent, he may be used with safety, but should be watched carefully and stopped as soon as attack commences.

APOPLEXY.—Apoplexy is often confounded with cerebral congestion, but true apoplexy always consists in rupture of blood vessels, with effusion and formation of blood clot.

Causes.—Two kinds of causes are involved in the production of apoplexy—the predisposing, and the exciting. Predisposing causes are those that cause a degeneration, or disease that weakens the blood vessels; the exciting ones are any that tend to induce cerebral congestion.

Symptoms.—There is insensibility; the horse staggers and falls; he froths at the mouth; the muscles twitch; the breathing is stertorous and difficult. The heart's action is little disturbed at first, but becomes slower, then quicker and feebler, and after a little ceases. The extent of paralysis depends upon location within the brain, which is functionally deranged by the pressure of blood clot.

TREATMENT.—

Place the animal in a quiet, cool place, and avoid all stimulating food. Give, in his drinking water, or in the feed, 1 drachm of Iodide of Potash twice daily for a week. Cold

applications to the head, as in "Inflammation of the Brain," may be of value. Generally terminates fatally, or renders animal useless.

PARALYSIS—PALSY.—Paralysis is a weakness or cessation of the power of motion and of feeling. There are two kinds—that in which both motion and feeling are affected, and the other in which only one or the other is lost or diminished. Paralysis may be general or partial.

Causes.—They are varied. Acute affections of the brain and spinal cord may lead to paralysis. Injuries, tumors, and disease of the blood vessels of the brain, all have a tendency in that direction. Pressure upon, or the cutting in two of a nerve, causes a paralysis of the parts to which such a nerve is distributed. Apoplexy may be termed a general paralysis, and in non-fatal attacks is a frequent cause of the various forms of palsy.

Symptoms.—If the paralysis is on one side only, the animal cannot walk straight, but goes round in a circle, and has not the proper use of that side. If in the hind quarters, the horse can raise himself forward, but is powerless in the hind parts. Prick him with a pin anywhere back of the injury and there is no sensation. If in the face and neck, the part will be twisted off toward the well side, and the diseased part will have no feeling. If general, and he cannot move at all, he soon dies.

TREATMENT.—

If horse can stand at all, put him in slings. Clip the hair close and apply a Spanish fly blister. See "To Blister," under "Ringbone." Apply the blister from the seat of the injury back to the croup. If it is paralysis of the face and neck, apply the blister at the base of the brain, over the poll. The application of Mustard pastes or strong liniments to the affected parts are recommended in place of the blister. Give internally, 1½ drachms of Fluid Extract of Nux Vomica, three times a day. If there is twitching of the muscles, reduce the dose.

SUNSTROKE; HEAT EXHAUSTION.—This term is applied to affections occasioned not exclusively by exposure to the sun's rays, as the word signifies, but by the action of great

heat combined generally with other causes, such as sultriness of the atmosphere and an unusual accumulation of electricity.

Causes.—Exposure to direct rays of the sun; exhaustion produced by long-continued heat and over-work; lack of proper care in watering, in allowing rest in shady places, and in proper feed, also contribute to the disease.

Symptoms.—Sunstroke manifests itself suddenly. Animal stops, drops his head, begins to stagger, and soon falls unconscious. The breathing is stertorous or snoring, pulse slow and irregular, cold sweats break out in patches on surface of body, and horse often dies without recovering his senses again.

In heat exhaustion, animal may become dull, and requires urging sometime before any marked symptoms; generally perspiration is checked, and then he becomes weak in gait, breath hurried or panting, eyes watery and bloodshot, nostrils dilated and highly reddened, assuming a dark purple color, pulse rapid and weak, the heart bounding, followed by unconsciousness and death. If recovery takes place, convalescence is slow.

TREATMENT.—

Shade the horse and roll him upon his chest and keep him there. Apply ice or very cold water to the head and along the spine, and give him a good stimulant—2 ounces of Alcohol or 4 ounces of Whiskey in a ½ pint of water. Be cautious about choking; injection, by the rectum, of moderately strong Ginger tea, or weak Ammonia water, may be of benefit. Brisk friction of the limbs, and the application of Spirits of Camphor is good. Repeat the stimulants in one-half hour, and after that every hour or two, if pulse has not grown stronger and slower. Sponge the body with cold water and then give brisk rubbing.

For heat exhaustion give same treatment. In either case loosen all tight straps. Convalescence will take place slowly and the animal will need to be kept where it is cool for a number of days. If fat, give a ¾-pound dose of Epsom Salts; also a teaspoonful of Saltpetre three times a day. If run down, give tonics, as for "Chronic Indigestion." Give time for thorough recovery before putting to work again.

In hot weather, wet sponges or light sun-shades on the head of the horse when at work, is a preventive. An animal that has suffered an attack is more liable to subsequent ones, when exposed to the necessary, exciting causes.

EPILEPSY—FALLING FITS.—

Causes.—Seldom due to any changes in the brain, although it may come from softening of that organ; violent derangement of the nervous system; constipation; worms; plethora; or it may arise from injuries about the head.

Symptoms.—There are no premonitory symptoms. The animal suddenly staggers, the muscles become cramped, jaws spasmodically opened and closed; the tongue is lacerated by the teeth; he foams at the mouth and falls in a spasm. The urine passes away involuntarily, and breathing may be arrested. The paroxysm soon passes off, and horse gets on his feet in a few minutes after the return of consciousness. Not a common disease with the horse.

TREATMENT.—

Dash cold water on the head during the paroxysm. After recovery, endeavor to find the cause and remove it; if from digestive disorders treat accordingly. In most cases a good purgative will not be out of place—1 ounce of Aloes. If due to nervous derangement, give 1 drachm Fluid Extract of Nux Vomica and ½ ounce Fowler's Solution of Arsenic two or three times a day. Feed on an easily-digested, laxative diet.

ELECTRIC SHOCK.—This may occur from a stroke of lightning, or from coming in contact with electric wires that have been broken. Electric railways and street lighting plants are now so common that it is not an uncommon occurrence for horses to be shocked.

Symptoms.—In shocks which are not immediately fatal the animal is usually insensible, the respiration slow, feeble, and irregular, and pupils of the eyes dilated and not sensitive. The temperature is lowered. There may be a tendency to convulsions

or spasms. The predominating symptoms are the extreme depression of the action of the heart, and of the respiratory organs.

TREATMENT—

Sulphate of Atropia ½ grain, or Strychnine 1 grain, in a very little water, should be given on the tongue, and repeated in an hour, and after that repeat once in two hours until the heart-beats are invigorated, the number and fullness of the respirations are increased, and consciousness returns. Stimulative injections, by the rectum, may be useful in arousing the circulation; for this purpose Whiskey in doses of ½ pint in a pint of water, or Ammonia water in doses of 2 or 3 ounces in a pint of water, may be used. Inhalations of Ammonia fumes are also of value. Rub the legs.

COMA—SLEEPY STAGGERS—CHRONIC INFLAMMATION OF THE BRAIN.—Coma is not a disease, but merely a symptom of a variety of affections of the brain. We sometimes have a type of coma in horses that cannot be attributed to any special disease of the brain, unless it be a chronic inflammation of the organ. This condition is commonly called "Sleepy Staggers," or the animal is called a "dummy."

Symptoms.—"Sleepy Staggers" is characterized by drowsiness, partial insensibility, sluggish and often staggering gait. Horse may drop his head in the manger and go to sleep with a clump of hay in his mouth, which is dropped when he wakens. Will stand for a long time with his legs in awkward positions. The bowels are more or less costive; the pulse is slow and soft; with no fever or pain. Animal may remain in this way for months without much change, or he may become gradually worse, until it is almost impossible to arouse him. Chronic cases are better in winter than in summer

TREATMENT.—

There is no treatment for long-standing cases. The horse may as well be killed. In more recent cases give laxative foods;

also 1 drachm Fluid Extract of Nux Vomica, three times a day. In addition give the following:

Iodide of Potash.....1¾ ounces.
Water..... 1 pint.
Dose: 1 ounce, morning and night. Give for a week, discontinue a week and then give again.

Strong stimulating liniments may be applied to the top of the head.

CHOREA.—This disease is marked by involuntary contractions of the voluntary muscles, especially of the hind limbs. Nervous horses are more subject to the trouble than sluggish ones.

Causes.—Are not well known, but may be due to pressure upon a nerve; to some injury of the spinal cord, or to some change in the brain, or spinal cord.

Symptoms.—The animal will seem to be all right after once started, but when first spoken to, the muscles of the hind limbs will tremble, there will be a jerking up of the limb, and then the animal will start and go off all right. Shows more in backing than in going ahead, also shows in stepping over in the stall, or in making a sudden turn when in motion. Resembles "String-Halt," except that the jerky action is not continuous.

TREATMENT.—

Treatment is not satisfactory. One drachm of Fluid Extract of Nux Vomica and ½ ounce of Fowler's Solution of Arsenic two or three times a day may be tried for a time. Iodide of Potash, as in the previous disease, may also be tried. Tablespoonful doses, twice a day, of a mixture of equal parts of Saltpeter and Sulphate of Iron may help. Unless the treatment benefits, the animal is apt to grow slowly worse.

STRING-HALT.—This is an affection of the hind leg, and it is known from the peculiar way in which the hind leg or legs are raised from the ground—a quick, spasmodic jerk

Causes.—There is not an entire agreement among veterinarians as to the nature of this affection, but it is quite generally believed to be a purely nervous one. It is more often seen in highly nervous animals, and may be brought on by the application of severe blisters to the legs; or by clipping them and leaving the horse out in the cold. Castration has been noted as a cause, either from the irritation of the rope on the fetlock, or from the operation. May develop without assignable cause.

Symptoms.—The leg is jerked toward the body at every step, sometimes so strongly as to strike the belly with the fetlock. It may be in one or in both legs. Sometimes it is so bad that the horse will stand and jerk up one foot and then the other, with no forward motion; but once started he will go along without hesitation. It is fatiguing and wearing, and horse seldom accumulates much flesh. Some horses show the trouble only in cold weather, and then only for a time after first starting.

TREATMENT.—

If taken at the very outset, treatment may be of benefit, but when well seated, no medicinal treatment has been found that affects a cure. Give the same treatment as is given in "Chorea." An extended run in the pasture is recommended for this affection. Sometimes the cutting of a tendon just below the hock will overcome the trouble; in other cases it will fail to have any benefit, or it may partially relieve. A veterinarian would be required for the operation

LOCO DISEASE.—Loco is a disease attacking horses and other animals in the great plains of the west, and is caused by the eating of two weeds called "loco weeds," the botanical names of which are Astragalus Mollissimus and Oxytropis Lambertii, both belonging to the family of plants bearing pods. These plants attain a height of six to twelve inches; the leaves are compound, and leaves and stems covered with very fine, minute hairs, which give the plant a gray or silvery look. The Astragalus is found mostly in the southern part of the plains, and the Oxytropis predominates in the northern section. The word "Loco" is from the Spanish, meaning "crazy."

Loco weeds remain somewhat green throughout the winter, and on account of their green appearance, when other food is scarce, animals usually begin to eat them in winter and spring, and though they do not seem palatable at first, yet after a time they acquire such a taste for them that they will leave other food to go in search for them. They will often stay by themselves where the weed is abundant, and may go days without water. They crop close to the ground, often getting a portion of the root.

Symptoms.—Animal falls away rapidly in flesh, after getting a taste for the weed, and as the difficulty advances, becomes so emaciated that in the last stages is unable to stand or move about, and unless otherwise destroyed, dies of starvation. In the early stages there is general sluggishness, difficult locomotion, stiff and stilted action of legs, with trembling of the voluntary muscles. If the animal lies down, and then tries to rise, several efforts are needed in order to succeed, and it may even turn a somersault in getting on its feet. Head trembles violently, and the beast may hold its mouth open for a time. Usually there is a peculiar, vacant look in the eyes. Will sometimes start at familiar objects, showing signs of fear, until nature of objects seems to dawn on the brain. Sometimes, though suffering for water, seems afraid to approach for fear of falling in. A straw, stick, or shadow across the path of a locoed horse, may cause him to shy, or jump high, in order to clear an imaginary obstacle. If allowed to stare at obstacle, it comprehends and will usually pass it freely. Locoed horses are subject to fits, or "crazy spells." These are apt to occur when at work on hot days. Becomes delirious, may rear and plunge, often falling to the ground unconscious, the eyes rolling in their sockets, so as to show the whites. Fits do not usually last long. It is generally believed that though a horse is broken of the loco weed habit he is not of much value, as the fits are likely to stay with him.

Locoed cattle do not shed their hair good in the spring, and can be told by the patches of old hair that still cling in mid-summer. As disease progresses the animal runs down and dropsical swellings appear on the head and legs, and other dependent parts.

TREATMENT.—

It was thought for a long time that loco was caused by poisonous properties in the plants, but chemical analysis has failed to find any such, and general symptoms indicate that animals suffer and die from starvation. The plant does not seem to contain enough nourishment to sustain life. Animals that show a tendency to eat loco plants, should be shut away from all such, and be fed on nutritious and easily digested food. A good tonic powder in addition may be given them—the mixtures recommended for "Chronic Indigestion."

Cattle and sheep should be fattened for the market,

HYDROPHOBIA—RABIES—This is a specific disease caused by an organism; most frequently seen in dogs, but may be communicated to all animals, including man. The virus is in the saliva, and the bite is the most common mode of transmitting the disease, although the saliva getting into any wound will produce it. The period of incubation varies in different animals. In the case of the horse it is from fifteen to ninety days.

Symptoms.—The first manifestations may be increased excitability and viciousness; will strike, bite, or kick, at any object near him; often bites his own limbs and sides. Eyes are staring and bloodshot, ears alert to catch sounds, and head erect. Sometimes horse will bite himself in location where bitten, and this may be first symptom. The furious symptoms appear in paroxysms; at other times he may eat and drink, although swallowing may become painful toward the latter stages of disease, and may cause renewed paroxysms. Finally hind limbs become paralyzed, breathing difficult, and convulsions follow; then death.

TREATMENT.—

There is none that is of any avail. If suspected, shut the horse up, so he can do no harm, and when sure of the trouble, kill him.

When a horse is known to have been bitten by a mad animal, cut away around the wound with a sharp knife, and cauterize

the wound with Caustic Potash or Lunar Caustic; or, in the absence of these, use a red hot iron. Whatever is done must be done at once to be of use.

The same preventive treatment as is used for man would probably be effectual. The expense, however, would perhaps render it impracticable in most cases.

LOCK-JAW, OR TETANUS—This disease is characterized by spasms affecting the muscles of the face, neck, body, and limbs, and of all the muscles supplied by the cerebro-spinal nerves. It is divided into two kinds—traumatic, when cause is evident; idiopathic, when not.

Causes.—The disease is caused by a specific germ. The organism is found in certain soils, and gains entrance into the body, as a general thing, through a wound. Sometimes disease develops without a detectable wound; it is then supposed to enter through the digestive tract. Small punctured wounds, as nail pricks, are most favorable, and especially if about the feet. The germs will not produce disease except in absence of air.

Symptoms.—The first symptoms noticed will be difficulty in chewing and swallowing, and the protrusion of the haw over the eyeball; the nose is protruded; the neck straightened; the tail elevated and trembling; the legs straddle and are as stiff as the legs of a saw-horse; the hocks turn out and toes of hind feet tend to turn in; the belly is tucked up; nostrils dilated; ears erect and stiff; breathing is hurried; muscles hard; horse may sweat profusely; the jaws are set and locked as disease advances. If head is raised, the haw is drawn completely over the eye; the tail is more elevated; he trembles all over, and if head is pushed a little farther up, he is likely to fall. Excitemant of any kind makes all the symptoms worse. He never lies down; cannot eat; drinks with great difficulty, and is in intense agony all the time. Death usually follows in from three to ten days. If he lives two weeks, may gradually recover.

TREATMENT.—

Treatment is of little avail, the majority of the cases terminating fatally. Place the animal away by himself, where it will

be quiet, in a darkened stall. Do not let any one, except one person, go near him, and that one only three times a day. Keep thin gruel before him continually; he cannot eat, but he may sip a little of the gruel. If he will sip it, also give a little milk with eggs in it; give these fresh three times a day; also keep a pail of fresh water before him. In some cases the horse will be able to eat a little for some time after the disease appears; if so, give bran mash, scalded oats, and grass, if in season. The drugs used are those that quiet. One grain Atropine and 6 to 10 grains of Morphine, dissolved in a very little water, can be injected onto the tongue by placing a small syringe in between the front and back teeth. Repeat three times a day. Never try to give medicine from a bottle, or in any large amount. Or, in place of the foregoing:

Fluid Extract of Belladonna ..... 2 drachms,
Bromide of Potash..... 1 ounce,
Water ..... ½ pint,
May be injected into the rectum three times daily.

It may be well to alternate, using part of the time the Atropine and Morphine, and part of the time the Belladonna and Potash. Cannabis Indica, another quieting drug, can be used in 2-drachm doses, along with the Belladonna and Potash.

If the animal has a wound, open it freely, so as to admit the air to the very bottom, and flush out freely with a strong solution of:

Carbolic Acid ..... 1½ ounces.
Water ..... 1 quart.

Inasmuch as punctured wounds, such as nail pricks, are frequently followed by this disease, they should always be kept well opened to the air while healing.

If taken at the very start of the disease, large hypodermic injections of Antitoxic Serum may be of value. This is the serum, or watery portion of the blood, of an animal that has been rendered immune to the disease. This treatment would require a veterinarian.

Sometimes the animal can be put in a sling to advantage; at other times it excites and makes them worse.

DISEASES OF THE LYMPHATIC SYSTEM

WEED IN THE LEG—LYMPHANGITIS—WATER FARCY.—This is an inflammation of the lymphatic structures, usually affecting the hind legs, very seldom the fore legs. It is sometimes called "Monday morning sickness."

Causes.—Horses of sluggish nature are predisposed to this affection. It usually attacks well-fed, lightly-exercised animals, and in such cases is due to the excess of nutritive elements in the blood. Sudden changes in the work or in the habits of the animal may bring it on. Horses that are well fed and worked hard, have it from standing in the barn over Sunday. Draft horses are more subject to it than road horses, and those with round, thick legs are predisposed to it.

Symptoms.—It is usually ushered in by a chill, rise in temperature, and some uneasiness. In a short time this is followed by lameness in one leg and swelling on the inside of the thigh. Gradually this surrounds the limb and goes down to the feet. The leg is very tender to touch, especially on the inside, the horse throwing it away from the body. The horse sweats; breathing is quickened; pulse hard, and quick, and temperature goes up to 104° to 106° F. Bowels become costive, urine scanty; symptoms usually increase for two days, then remain stationary for some time, then fever abates, the swelling recedes and becomes less painful. When once attacked with this disease, the animal is more apt to have it again, and the result of successive attacks is "Big Leg" or Elephantiasis. Quite often some of the lymphatic glands will suppurate and an abscess will form; this may take place anywhere from the body to the foot.

TREATMENT.—

Both local and internal. Locally, apply hot fomentations; wrap the leg from the foot to the body in a large woolen blanket, put a back-band and crupper on the horse and fasten blanket up to this. Keep the blanket as hot as the animal will stand, by pouring onto it, every fifteen to thirty minutes, hot water. Apply the

fomentations for two or three hours at least twice a day; in bad cases, keep it up continuously during the day. Each time when the fomenting is discontinued, rub dry and apply the following liniment:

Witch Hazel	2 ounces.
Soap Liniment	3 "
Laudanum	2 "
Turpentine	1 ounce.

Shake. Apply with liberal friction at least twice a day.

If abscesses form, and not near a joint, open when they point and treat as "Abscesses;" if near a joint, poultice and let them break.

Internally, give a purgative—1 ounce of Aloes or ¾ pound of Epsom Salts—feeding sparingly on laxative food, bran mash, handful of Linseed meal, little hay. Also give the following:

Fluid Extract of Aconite	2½ drachms.
Fluid Extract of Belladonna	2 ounces.
Fluid Extract of Colchicum Seed	1 ounce.
Saltpeter	4 ounces.
Water to make	1 quart.

Shake. *Dose:* 2 ounces, four times a day.

If temperature runs high and stays there, give:

Acetanilid	1 drachm,
Alcohol	1 ounce,
Water	½ pint,

Once or twice a day, as occasion requires.

As the disease has a great tendency to leave the leg enlarged, treatment should be begun early and continued vigorously.

After having had one attack, the animal should receive special care to prevent a return. Feed rather light of a grain ration of bran, oats, and Linseed meal, (no corn), a few roots or potatoes; run at grass when in season. About every third or fourth week give a teaspoonful of Saltpeter two or three times a day for a week. One-half pound doses of Epsom Salts once in two or three weeks are also good.

BIG LEG—ELEPHANTIASIS.—This is a thickened condition of the leg from repeated attacks of lymphangitis, or weed in the leg. When the disease becomes seated, a complete cure is not possible.

Symptoms.—The leg is enlarged, sometimes all the way to the body, again only as far as the hock; the enlargement is sometimes slight, then again, the leg will be two or three times its normal size. There is no lameness, but horse may carry leg a little stiff.

TREATMENT.—

If the condition has existed for any great length of time, treatment will do no good; if recent, feed on laxative diet, grass, if in season, if not, clover hay, bran, oats, Linseed meal. Give about 4 drachms of Aloes or ½ pound of Epsom Salts every third day, unless bowels become too loose; if so, not as often. Also give a teaspoonful of Saltpeter two or three times a day, skipping every other week. Exercise twice daily to remove all the swelling possible, and when he comes in give liberal hand-rubbing, apply liniment as in "Lymphangitis," and then apply cold fomentations; wrap the leg with a blanket and keep it wet with cold water.

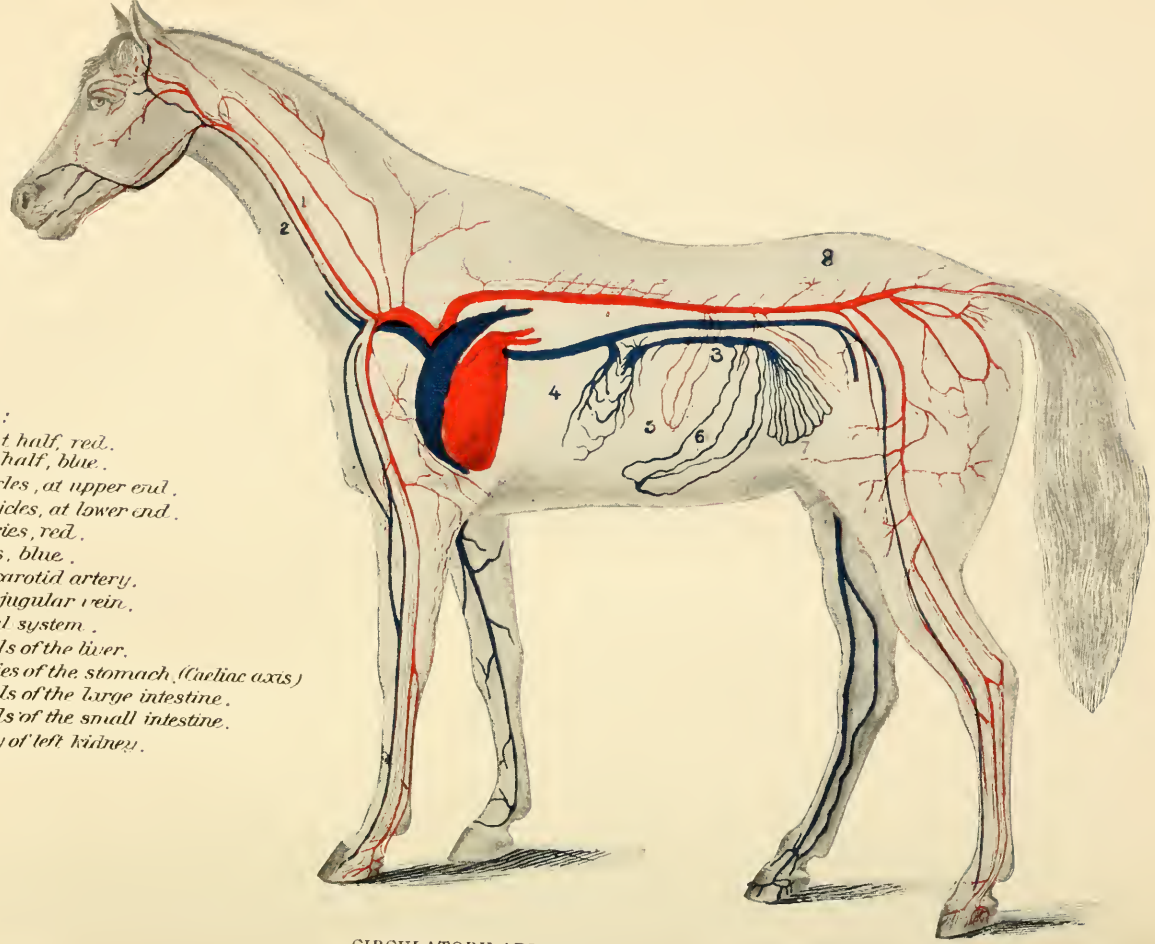
SWELLING OF THE LIMBS—STOCKING.—The above are titles applied to a swelling of the leg, usually confined to the parts below the knees and hocks, although in bad cases it extends above these joints.

Causes.—It is caused by sluggishness of the lymphatic glands and kidneys in performing their offices. Standing still is a common cause; so much so that there is a great deal of it just from standing from night until morning. It is most common in badly drained and illy-ventilated stables: and in young horses more than in old ones. A horse which has stood in the stables during the winter months, and then is put to hard work at once, is apt to show it. After resting at night, his legs will be swollen the next morning. It is also often a symptom of some disease.

Symptoms.—Swelling of the legs without any other sign of disease; the swelling disappearing with exercise, but returning when standing any length of time.

TREATMENT.—

The same as for "Elephantiasis."



Heart :
Right half, red.
Left half, blue.
Auricles, at upper end.
Ventricles, at lower end.
Arteries, red.
Veins, blue.
1, Left carotid artery.
2, Left jugular vein.
3, Portal system.
4, Vessels of the liver.
5 Arteries of the stomach (Cœliac axis)
6, Vessels of the large intestine.
7, Vessels of the small intestine.
8, Artery of left kidney.

CIRCULATORY APPARATUS.

DISEASES OF THE HEART, ARTERIES AND BLOOD-VESSELS

INFLAMMATION OF THE ENDOCARDIUM—ENDOCARDITIS.—This is an inflammation of the serous membrane, lining the heart. It is not a common disease, and is one that is hard for the inexperienced to recognize. The disease may not be fatal in its early stages, but from incomplete recovery there is a permanent thickening of the valves, which is the beginning of valvular disease.

Causes.—It is met with in general rheumatism, involving the serous membrane, in some of the specific fevers, in septic poisoning and in influenza.

Symptoms.—May be ushered in by a chill, with marked rise of temperature; pulse decreases in strength or becomes irregular, while heart beats more or less tumultuously. In early stages, soft, blowing sounds may be heard by placing ear over heart on left side, which correspond in number and rythm to heart's action. Excessive pain is manifested when animal is compelled to trot; often difficulty in breathing is developed early in attack. When valves are involved, visible mucous membranes become either pale or very dark colored, and horse may faint if head is suddenly elevated. There may be marked lameness of the left shoulder, and if horse is turned to the left, he may groan with pain and the heart become violently excited, though pressure will not produce pain, unless roughly applied. There is no appetite, and animal does not drink much. Surface of body and extremities are cold, and frequently body is in a subdued tremor. There is usually suppression of urine. Symptoms may continue for from three to seven days without marked changes. If he shows signs of improvement, they will be slow and steady until he seems all right, but when taken out and urged, the breathing may become like that in heaves, and all symptoms return in a modified form.

TREATMENT.—

In some respects disease of the heart is the most difficult of all conditions to treat. When any organ is inflamed, the treatment generally is to let that organ rest and stimulate others to do its work as far as possible; this cannot be done with the heart, and so perfect quiet is necessary, that in this way the heart may be relieved. Give clean, well ventilated stable and clothe warmly. If the animal shows any desire to eat, give grass, if in season, or bran, scalded oats, Linseed meal, and a little hay.

Internally, give the following:

Fluid Extract of Belladonna.....	1 ounce.
Fluid Extract Digitalis.....	½ "
Fluid Extract of Colchicum Seed.....	½ "
Saltpeter.....	2 ounces.
Water to make.....	1 pint.

Shake. *Dose:* Two ounces, three or four times a day.

In early stages, if heart beats rapidly and irregularly, give 10 to 15 drops Fluid Extract of Aconite, four or five times a day. Later, if heart gets weak, give 1 grain of Strychnine, in a little water, three or four times a day. If animal improves, give one ounce of the following, three times a day:

Iodide of Potash.....	1 ounce.
Water	1 pint.

Also give the Gentian and Nux Vomica mixture as for "Chronic Indigestion."

If there is any reason to believe that rheumatism is the cause, give 2-drachm doses of Salol, three times a day.

INFLAMMATION OF THE SAC SURROUNDING THE HEART—PERICARDITIS.—The sac surrounding the heart is called the pericardium.

Causes.—May be caused by cold or damp stabling, exposure and fatigue, from wounds caused by broken ribs, etc. Generally it is associated with an attack of influenza, rheumatism, pleuritis, etc.

Symptoms.—Usually there are chills, with pain in moving; a short, painful cough; rapid, short breathing; high temperature, and a rapid, hard pulse. The fever and pulse are highest in the evening and lowest in the morning. In early stages the pulse-beat is regular; later, when there is much effusion in the sac, the heart-beat becomes muffled, and may be of a redoubled, or rebounding, character. In the early stage, when the ear is placed at left side of chest, behind the elbow, a rasping sound is heard, corresponding to frequency of heart-beat. This is called "to and fro friction sound." Between the second and fourth days this sound may disappear on account of distension of the sac, by liquid exuded. When effusion partly fills the pericardium, percussion will show an increased dullness over heart region, and the heart-beats become less marked than in health, and sometimes a splashing, or flapping, sound is heard. If effusion becomes absorbed, the "to and fro" sound usually recurs for a short time; this friction may often be felt with the hand on the side of chest. When the disease is associated with rheumatism, or influenza, some symptoms may be obscure, but careful examination will reveal enough to diagnose the disease. Disease is usually fatal, especially when complicated with other disorders.

TREATMENT.—

The treatment for this disease is quite like that for "Pleurisy"—the arresting of the inflammation and the absorbing of the serous effusion.

Give well-ventilated stall, clothe warmly, and feed laxative diet.

Internally give the following:

Fluid Extract of Aconite.....	1½ drachms.
Fluid Extract of Digitalis.....	½ ounce.
Fluid Extract of Colchicum Seed....	½ "
Fluid Extract of Belladonna.....	1 ounce.
Saltpeter.....	2 ounces.
Water to make.....	1 pint.

Shake. *Dose:* Two ounces, four times a day.

After three or four days, drop out the Aconite. Give 2 or 3 ounces of Liquor Ammonia Acetatis three times a day. If heart

gets weak, give 1 grain Strychnine four times a day. If animal improves, give 1-ounce doses three times a day of:

Iodide of Potash	1 ounce.
Water	1 pint

Apply a strong Mustard paste to the left side of the chest. During convalescence, give the tonics, as for "Chronic Indigestion."

ENLARGEMENT OF THE HEART.—HYPERTROPHY.—This disease is an enlargement of the substance of the heart, with or without cavity changes. It may occur in various forms.

Causes.—Diseased valves of the heart; determination of blood to that organ; from a latent form of inflammation of muscular structure; or from long-continued increase of action dependent upon nervous disease. It may occur in connection with other chronic disorders.

Symptoms.—In addition to the usual symptoms manifested in organic diseases of the heart, there is a powerful and heaving pulse at each beat, which is apparent on left side, and even on the right sometimes. These beats are regular, and when strong and full at the jaw, there is a tendency to active congestion of the capillary vessels, which frequently gives rise to local inflammation, active hemorrhage, and the like. In case of enlargement with dilatation, the impulse is not only powerful and heaving, but it is diffused over the whole heart surface, and the normal sounds are increased in intensity. Percussion reveals an enlarged area of dullness, while the impulse is usually much stronger than normal. Dropsy of the pericardium will give same wide space of dullness, but the impulse and sound are lessened. An animal with moderate degree of enlargement may live a number of years, and be capable of ordinary work; it depends on accompanying disease. As a rule the disease is incurable.

TREATMENT.—

If the cause can be discovered and be removed, it should be done. Iodide of Potash may be of use if continued for a sufficient length of time. Give it in 1-drachm doses once daily for

a month or more. General tonics, freedom from excitement, avoidance of bulky food, and good ventilation are indicated.

ATROPHY OF THE HEART—WASTING OR SHRINKING.—This is a shrinking away of the heart substance. The walls become soft and flabby, and fail to perform the work in a healthy manner.

Symptoms.—Pulse is weak and irregular, often missing two or three beats at a time. There is emaciation, languor, and pallor of visible mucous membranes. Death is likely to occur at any time from formation of blood clot.

TREATMENT.—

Give good food and 1 drachm Fluid Extract of Nux Vomica three or four times a day. After two weeks, give the tonics as for "Chronic Indigestion."

FATTY DEGENERATION OF THE HEART.—This may involve the whole organ, or be circumscribed to patches. When general, the substance is flabby or flaccid, and in extreme cases, collapses when emptied or cut.

Causes.—It is associated with other morbid conditions of the heart, as obesity, dilatation, rupture, aneurism, etc. It may be connected with fatty diseases of other organs, as the liver, kidneys, etc. It may be due to condition of blood in wasting diseases, or to poisoning with arsenic and phosphorus.

Symptoms.—The most prominent symptoms are feeble action of the heart, a remarkably slow pulse, general debility, and attacks of vertigo. It may exist for a long time, but is apt to terminate in death on the occurrence of other diseases, surgical operations, etc. It may involve a liability to sudden death from rupture of the ventricular walls.

TREATMENT.—

Is of little use; counteract weakness, as in previous disorder; give regular exercise.

PALPITATION OF THE HEART.—This is an excited spasmodic beating of the heart, and by some is termed "thumps," which term, in this book, is applied to a spasmodic action of the diaphragm.

Causes.—It may be due to indigestion, to fright, increased nervousness, sudden excitement, over-exertion in speeding, or pulling, or may follow weakening diseases. It is more likely to occur in hot weather. Most common cause is hard work when not accustomed to it.

Symptoms.—The heart may act with such violence that each beat may jar the whole body of the horse; very frequently it may be heard at a short distance away. The pulse will be rapid and tumultuous. The countenance has an anxious look, and usually the horse is bathed in perspiration. The nostrils are dilated, and breathing rapid.

TREATMENT.—

Stop and give the animal rest, blanket warmly and give stimulants: Two ounces of Alcohol, or 4 ounces of Whiskey, in a little water; repeat in half an hour, and again in one and one-half hours. Also give 12 drops of Fluid Extract of Aconite, and 1 drachm of Fluid Extract of Belladonna; repeat in an hour. After the acute symptoms have passed, give Fluid Extract of Digitalis, ½ drachm, three times a day for a few days, and the tonics as for "Chronic Indigestion." Condition for work carefully.

TUMOR (ANEURISM) OF AN ARTERY.—This is a diseased condition of the walls of an artery, in which the walls become enlarged, forming a tumor.

Symptoms.—If the aneurism is in a superficial artery, it appears as a tumor in the course of the artery, and pulsating with it. It is round, soft, and compressible, yielding to pressure. The beating in unison with the heart is the characteristic symptom. Aneurism occurs in the abdominal and chest cavities, and creates obstruction and disturbance, but no characteristics can be given that would be of any use. They may rupture, causing sudden death.

TREATMENT.—

Nothing can be done by way of treatment, except if superficial, and located where it is possible, a gentle compress can be applied.

RUPTURE OF AN ARTERY.—The inflammation of the wall is the primary cause of rupture in most cases. It will cause death when it involves a large vessel, especially if it is situated in one of the large cavities, permitting an excessive escape of blood. It may arise from mechanical violence, or as a result of accident.

Symptoms.—In fatal rupture with profuse bleeding, animal becomes weak, the visible membranes become blanched, breathing hurried or gasping, pupils dilated, staggering in gait, swooning, and death. When limited, the symptoms may not be noticeable. When near the surface of the body a tumor or swelling will form. As a secondary result of rupture of this kind, there may be formation of an abscess.

TREATMENT.—

When the rupture of a deep-seated artery is suspected, give Fluid Extract of Ergot in 1-ounce doses to produce contraction of the blood vessels. Tannin in 2-drachm doses, or Tincture of Iron in 1-ounce doses are also useful. The animal should be allowed to have as much water as he desires. Afterward give stimulants and nourishing food.

INFLAMMATION OF A VEIN—PHLEBITIS.—Inflammation may be simple, or diffuse. If the first, it is confined to a limited portion; if diffuse, it involves the vein for a long distance.

Causes.—Contusions, or direct injuries; an extension of inflammation from the surrounding tissue, as in abscess, tumor, or malignant growth. It may be due to the presence of infective material, gangrenous matter, etc. When blood-letting from the jugular vein was practiced, a case of dangerous phlebitis was not unusual, being brought about by using rusty, or dirty instruments, or from improper care afterward. Not so common since bleeding has become a thing of the past.

Symptoms.—The vein swells, gets hot, sore, red, and painful; the inflammation spreads to surrounding parts, and much swelling is a result. A diffused swelling, with great tenderness, may extend along the vein, and the animal will manifest all the symptoms as in an acute fever. The effect of this is quite often the obliteration of the vein, which becomes hard, filled, and ceases its function. In the case of the jugular vein this condition is serious, since the horse cannot graze, owing to the blood that is forced to remain in the vessels of the head and neck, causing congestion of those parts, they being in a pendant position

TREATMENT.—

Foment the part affected with cloths and hot water three times daily, and manipulate the vein to get obstruction to move on, if it will. If nothing results, apply a smart blister along the course of the inflamed vessel, early opening any abscesses that may form. Give the horse complete rest, and feed bran mashes to keep the bowels free. If fever runs high, give ½-ounce doses of Nitrate of Potash in drinking water three times daily, which may be changed in two or three days for 1-drachm doses of Iodide of Potash twice daily.

GENERAL DISEASES OF THE BLOOD

BAD BLOOD.—This is an impure condition of the blood.

Causes.—From heavy work and feeding highly nutritious food; or from exposure with very poor food—as for example, the run of the straw-stack.

Symptoms.—In the latter case, the animal is weak and does not thrive, becoming hide-bound. The coat is rough, dry, and scurfy. If the animal is warmed up, pimples are apt to form over the body; when horse stands in the stable over night, his legs swell; and if exposed to the weather, scratches ensue; animal is dull and unfit for work. Feeding does not bring him up.

If from high feeding, animal may be in good condition, but the eruption of the skin and the swelling of the limbs indicate the disease.

TREATMENT.—

If in good condition give a purgative—an ounce of Aloes, or ¾ pound of Epsom Salts; if in poor condition, give raw Linseed Oil, 1 quart, and repeat in two or three days; give a laxative diet and a teaspoonful of Saltpeter three times a day for a week, after which use the two mixtures as for "Chronic Indigestion." A teaspoonful of Sulphur once or twice a day is also good. If in the spring, give a run at grass. If he has to be kept in, give regular exercise. May have to continue treatment for some time.

PURPURA HEMORRHAGICA.—

Causes.—This disease usually occurs as a sequel to debilitating diseases, such as strangles or distemper, influenza and other weakening ailments. It may arise from badly ventilated stables, and among poorly fed horses. Exposure to storms when in a run-down condition may also bring on an attack of the disease. It is apparently due to a deterioration of the blood, weakness of the capillary vessels, and general debility or exhaustion of the nervous system. Certain micro-organisms may play a part in its production. Sometimes develops as an independent disorder, with animal in good condition.

Symptoms.—The disease generally comes on rather suddenly, and is shown by swellings on various parts of the body, on the head, or lips, limbs, abdomen, etc. They pit on pressure, and are but slightly painful to touch. Swellings are characterized by sudden termination and stop abruptly; is not so noticeable below hocks and knees, as above; also seen about head and on underside of abdomen. The mucous lining of the nose and mouth is covered with dark red or purple spots, at first small, but soon run together and form quite large patches; a bloody serum flows from nose, the tongue may be swollen so as to prevent eating. In two or three days bloody serum will exude from the pores of the skin over swollen places; later abscesses may form. The fever is moderately high, the pulse is frequent, and weak, and

becomes weaker as strength fails. A cough is usually present. Urine is scanty and high colored, and if bowels are much affected a bloody diarrhea may set in, with colic pains. Some of the internal organs may become implicated in the disease. A few cases run a mild course, and begin to improve in three or four days. In severe cases, septic poisoning is apt to occur, which soon causes death. The appetite may remain fairly good, especially in the milder cases.

TREATMENT.—

The treatment is to nourish the animal well and give tonics to build up the system. Give nourishing, laxative food, good hay, bran, Linseed meal, scalded oats. Place in a clean, well ventilated stall. Give the following medicines:

Tincture of Iron	1 ounce.
Quinine	1 drachm.
Water	1 pint.

Give as one dose; repeat three or four times a day.

Iron is a very important drug in this disorder. Also give the following, having an hour or so elapse between doses of this and the foregoing:

Fluid Extract Nux Vomica	2 ounces.
Fluid Extract Colchicum Seed	1 ounce.
Fluid Extract Gentian	3 ounces.
Fluid Extract Digitalis	1 ounce.
Saltpeter	2 ounces.
Water to make	1 pint.

Dose; 1 ounce, in a little water, three or four times a day.

If heart shows weakness, give an ounce of Alcohol in ½ pint of water three times a day. Two-ounce doses Hyposulphite of Soda, in ½ pint of water, three times a day, are good. If temperature should run high, give as one dose:

Acetanilid	1 drachm.
Alcohol	1 ounce.
Water	½ pint.

Once or twice a day.

If swellings become bad about the head, so as to interfere with breathing or eating, foment with hot water and keep the head up higher than the body. If abscesses form, open them and treat as described under "Abscesses." After horse improves somewhat, change treatment and use tonics as for "Chronic Indigestion." A veterinarian can give the Serum treatment.

RHEUMATISM.—

Causes.—This is supposed to be caused by an accumulation in the blood of a peculiar acid, or of some natural acid in excess. Upon the slighest provocation in the way of exposure, or derangements of the stomach and bowels, it is apt to assume the acute form, and to cause intense pain and lameness.

Symptoms.—There is lameness, usually of a peculiar kind, flying from one joint to another, and from one leg to another; sometimes the parts swell, and sometimes not; the joints most commonly affected are the fetlocks, shoulders, and hips. There is usually more or less fever, elevation of temperature, high pulse, and sometimes suppuration of the affected parts. Sometimes it attacks the muscles, causing them to contract, and changing the shape of the part; the contraction produces pain, and the animal moves the affected member frequently, swinging it, or pawing; if in a joint, it causes severe lameness, if in muscles stiffness.

TREATMENT.—

Place the animal in a dry, well ventilated, but warm box stall, blanketed warmly; give a mild purgative—6 drachms of Aloes, or ½ pound Epsom Salts—and afterwards keep bowels active by giving from ½ to 1 pint of raw Linseed Oil daily; feed laxative diet, roots, bran, and a little hay. Give the following:

Fluid Extract of Belladonna	2 ounces.
Fluid Extract of Colchicum Seed	6 drachms.
Liquor Ammonia Acetatis	1 pint.
Saltpeter	3 ounces.
Water to make	1 quart.

Dose: 2 ounces, three or four times a day.

Also give as one dose:

Salol	1 to 2 drachms.
Alcohol	½ ounce.
Water	½ pint.

Three or four times a day.

If the temperature runs high, give:

Acetanilid	1 drachm.
Alcohol	1 ounce.
Water	½ pint.

Once a day.

Apply dry heat to the affected part, in the form of hot woolen blankets, hot salt bags, or hot water bottles; also bathe the part with some good liniment, perhaps the following:

Witch Hazel	2 ounces.
Soap Liniment	3 "
Laudanum	2 "
Turpentine	1 ounce.

Shake.

If a joint is affected and the lameness remains after the acute symptoms subside, apply a blister. See "To Blister," under "Ring Bone."

ABSCESSES.—An abscess is a gathering of pus in a sac from a morbid process in the glands, muscular tissues, or even in the bones. There are two kinds, which may be classed as acute, and cold or chronic abscesses.

Acute abscesses may arise from distemper; from bruises; from cuts healing with foreign matter in them; or from impurities in the blood. They are apt to form in any part which becomes highly inflamed. A good example are those in the glands after distemper. There is an increase in size, glands becoming firm, hot, hard and painful At first swelling is uniformly hard over entire surface, but it soon becomes soft (fluctuating) at some portion, mostly at the center. From this time on the abscess is said to be "pointing" or "coming to a head," which is shown by the small elevation, which at first is dry, but soon becomes moist from the serum transuded. The hair over this part loosens and falls off, and in a short time the abscess opens, contents escape, and cavity gradually fills up. When in the muscular tissue,

abscesses are usually the result of bruises or injuries. In all cases where abscesses are forming, the ripening should be encouraged with hot, soft poultices—Linseed meal is the best—until it points or comes to a head. Then open with a knife, unless in the region of a joint or a large blood vessel, when it is imperative to let the abscess open of itself. When open, press gently with fingers to remove the clots of thick pus and flush out freely, first with water, then with a Carbolic Acid lotion:

Carbolic Acid..... ½ ounce,
Water ..... 1 pint,

Using a bulb syringe. Probe the abscess with the finger, and if opening is too high to allow of good drainage, enlarge it or make another. Be very careful in probing abscesses about joints. It is a good plan to inject into old abscesses, after they have been cleaned out, 2 or 3 drachms of the Tincture of Iodine, pressing on the walls after the injection so as to paint the whole interior; repeat daily for three or four days. Do not let the opening into the abscess close too quickly; enlarge it if it closes too rapidly—as it will unless large in the first place. If walls of abscess are thick and hard, poultice for a few days after opening. Repeat the flushing out of the abscess daily for three or four days, then once in two or three days until well.

"Cold Abscess" is the term applied to those large, indolent swellings that are the result of a low or chronic form of inflammation, in the center of which is a small collection of pus. They are mostly met with at the base of the neck and in front of the shoulder joint, and are caused by the irritation of a loose or badly-fitting collar. The swelling is diffuse, slightly hotter than the surrounding parts, and not very painful to touch. This swelling subsides gradually, and leaves the hardened mass fairly well defined. One of the characteristics of cold abscesses is their tendency to remain in the same condition for a long time. If, however, the horse is put to work, the surrounding tissues assume a tumor-like condition, which, after a few days' rest, disappear, leaving about as before. Sometimes, by careful examination, what appears to be a fluid may be discovered deep-seated in the center of the mass. It may be but little, not more than a tablespoonful,

and is not easily detected. In such a case the treatment consists in exploring the tumor with a small trocar and canula, or hollow needle, for the presence of pus. When found, make an incision into the tumor and let the pus escape. After this, induce active inflammation of the tumor to promote the solution of the thick walls of the abscess. Insert well into the incision oakum or cotton saturated with Turpentine or Tincture of Iodine, or pack incision with Sulphate of Zinc and leave in for twenty-four hours. These agents set up a destructive inflammation of the walls. Matter is generated, and this is to be encouraged by poulticing as in an acute abscess. Orifice must be kept open, and if disposed to heal, again introduce some of the agents as above. If after the abscess heals, there is still a little enlargement, apply once or twice a day, with liberal rubbing, the following Iodine Ointment:

Iodine Crystals	2 drachms.
Iodide of Potash	1 drachm.
Biniodide of Mercury	20 grains.
Vaseline	2 ounces.

Mix.

Follow the application of a little of the ointment with ten to fifteen minutes' rubbing with a rub cloth. If the part gets sore after a few applications, withhold for a time and then apply again.

ERYSIPELAS.—Not very common, except in certain sections. It is an inflammation of the skin. It may be superficial and only involve the upper layers of the skin, or deeper seated and involve the under layers. The superficial does not suppurate, but the deep seated usually does. It is believed to be contagious, and to be due to a bacterial poison. It sometimes rages as an epidemic. It usually follows wounds, injuries, and sores, but may come on an apparently healthy skin.

Causes.—It is, as above stated, due to a germ, but the following are favorable conditions for the development: Damp, hot, and oppressive weather, especially if horses are kept in low, unsanitary places. The suppression of a chronic discharge; feeding on rich, heating food, when horse has been accustomed to

poor, scanty food; keeping animals with open sores near decomposing animal tissues, are also favorable conditions. The common means of contagion is by using same sponge on erysipelatous and healthy sores, and by use of harness, clothing, etc.

Symptoms.—There is usually fever, with pulse and temperature raised; urine scanty and high colored; bowels usually constipated; loss of spirits and appetite. This may be followed in the course of twelve hours by a diffuse swelling that is hot, red, and painful; if on a white skin, it will be found shining, tense and deep red. It spreads rapidly, terminating at edges in a well marked line. Swelling does not pit on pressure, but returns when finger is taken away. It may attack a wound in any part of the body, but aside from that, is most common in head and legs. There is a peculiar odor, like burnt hair.

TREATMENT.—

Place in a very clean, well ventilated stall. Internally, give laxatives, as a pint to a quart of Oil, or ½ pound of Epsom Salts, and give laxative, but nourishing, food,—bran, scalded oats, roots, hay. Also give internally:

Fluid Extract of Colchicum Seed	½ ounce.
Fluid Extract of Digitalis	3 drachms.
Saltpeter	2 ounces.
Alcohol	4 ounces.
Water to make	1 pint.

Dose: 2 ounces three or four times a day.

Also give, alternating with the foregoing:

Tincture of Iron	½ ounce.
Quinine	½ drachm.
Water	½ pint.

Three times a day.

If the temperature runs high, give:

Acetanilid	1 drachm.
Alcohol	1 ounce.
Water	½ pint.

Morning and night.

Locally apply to the diseased parts astringent and antiseptic lotions.

For an antiseptic:

Carbolic acid	½ ounce.
Water	1 quart.

Apply two or three times a day.

For an astringent use:

Acetate of Lead	1 ounce.
Water	1 pint.

Or:

Sulphate of Iron	2 ounces.
Water	1 pint.

Apply two or three times a day.

Keep the affected part covered with cloths wrung out of a solution of Hyposulphite of Soda.

Hyposulphite of Soda	4 to 6 ounces.
Water	1 pint.

If possible get a veterinarian to give serum treatment, as used in human family.

If abscesses form, open and treat as described under "Abscesses."

DISEASES OF THE BONES

CARIES, OR ULCERATION OF A BONE.—This may affect any bone in the body. The bones most frequently affected are the teeth, the lower jaw, bones of the neck, spines of the back, bones of the tail, in fact any bone sustaining an injury severe enough to cause a sloughing of the bone substance.

Causes.—Wounds of any kind, affecting the bone, are liable to be followed by inflammation and ulceration.

Symptoms.—A peculiar, offensive odor of the pus from the wound is the first indication that the bone is affected—an odor like decayed teeth. The discharge that comes directly from the bone is small, but enough to give the odor to the pus from the

wound. The surface of the bone is rough. The surrounding parts swell considerably, and become in time hard and calloused. The discharge, if applied to silver, will tarnish it.

TREATMENT.—

Wash the part and make an opening on the under side, if possible, to allow the free escape of pus. Scrape the diseased surface of bone with a dull-edged instrument, to remove the diseased portion, and dress twice daily with the following lotion:

Hydrochloric Acid	2 drachms.
Water	½ pint.

Mix.

Apply with a swab directly to diseased spot on the bone. This will stop progress of disease and promote healthy growth. Continue with this until all disease of the bone is gone; then change to the following to heal the flesh wound:

Sulphate of Zinc	6 drachms.
Sugar of Lead	1 ounce.
Water	1 pint.

Mix. Shake and apply three times daily.

Also flush wound with Carbolic Acid solution. Tincture of Myrrh is also good, and if weather is cold, Friar's Balsam is probably one of the best things for flesh wounds.

NECROSIS, OR DEATH OF A BONE.—This is the death of a part or the whole of a bone; usually seen in the longer, harder bones of the body, and quite often in the lower jaw-bone of horses that pull very hard on the bit.

Causes.—External violence is generally the cause, setting up an inflammation of the covering of the bone (the periosteum) and cutting off the nourishment of the bone so that it perishes.

Symptoms.—There will be inflammation, the formation of an abscess with one or more openings in the skin, through which the pus will find its way; the offensive odor, as in the preceding disease, will be present, and occasionally a bit of dead bone will pass out with the discharge. The discharge is irritating and galls the surface it runs over.

TREATMENT.—

Make the opening large and downward, to favor a free escape of pus, and remove dead bone as fast as possible. The sooner removed the sooner the bone will heal. Keep parts clean and dress three times daily with the following:

Carbolic Acid..... 1 ounce.
Water..... 1 quart.
Inject into wound.

Also use the Hydrochloric Acid solution, as in preceding disease. If a limb is affected, put the animal in a sling. If jaw-bone, feed on sloppy, easily-masticated food.

RICKETS.—The term rickets is used to denote an unnatural softness of the bony structure in young animals. It is due to a deficiency of earthy, and an excess of animal, material in the bones. It may be seen in colts, calves, and in young dogs, especially spaniels and pointers. In colts and calves the cannon bones of the front legs generally bend first, while in dogs the lower third of the upper arm bone, giving the animal a dwarf-like look. When the bones of the hind legs are affected, the toes are turned outward, the hocks inward.

Rickets appear when the animal is but a few weeks, or a few months old, caused by constitutional debility, scrofulous tendency, or by external and preventable causes. Thus we find it in calves, which are not allowed to suck the mother; in foals, when the mare is taken to work, and colt allowed to suckle at morning and night, or at most three times a day; young animals fed on artificial food in place of milk and kept without exercise.

TREATMENT.—

This must be both local and constitutional, and to be successful it must be energetic and persevering, regardless of trouble, until a cure is effected, or it becomes plain that case is hopeless. If the milk of the mother is suspected, change or increase her food, —use bran, and give her alteratives and tonics. Give the mother the mixtures as recommended for "Chronic Indigestion." Also give her a teaspoonful of Phosphate of Lime twice daily. The limbs of the young should be supported by splints of heavy leather or wood, with bandages, or by sticking a strong piece of

canvas around a strong splint and lacing it around the limb. Care must be taken that the splint does not chafe the limb in any way. Put a bandage around the leg before applying the splint. The splint of wood should be applied to the concave side of the curve, taking care that it is long enough to reach the part of the limb that is not bent, both above and below curves. Keep animal in a level yard, and give foods that tend to make bone, as oatmeal and bran to colts, and bones to dogs. Also give the young a little of the same mixtures as recommended for the mother, especially so if the young is not sucking. Give the colt from one-sixth to one-half the mother's dose.

BIG HEAD.—OSTEO POROSIS.—This is a disease that attacks horses from one to four years of age, rarely older, and gradually comes on without any signs of soreness. The bones of the head, and sometimes legs, get larger and larger, and become very porous and brittle. It more often affects the bones of the head than of any other part of the body. An uncommon disease, except in certain localities.

Causes.—The cause of the disease is not known, but by some is supposed to be caused by feeding on pasture lands deficient in the salts of lime. Others attribute it to the grass of low-lying, swampy lands, where there is a lack of nourishing substance.

Symptoms.—At first the symptoms are not well marked, but the horse is noticed to be dull, falls off in condition, and his muscles will get very soft. This may continue for several months before the true nature of the disease will develop. Horse will seem stiff when traveling, his belly becomes very gaunt, and the head will be noticed as getting larger than natural; then, after this, the bones of the legs may also become enlarged, or sometimes these enlarge early in the course of the disease, and as the disease goes on the bones grow larger, the animal continues to run off in condition until he dies. It is said that in some cases, when walking, one of the bones of the legs have broken in consequence of condition.

TREATMENT.—

The treatment of this disease is not satisfactory, and if disease has been running any length of time, it is best to put the horse out of his misery. If in the early stages, give good nourishing feed, along with the two mixtures as recommended for "Chronic Indigestion." Also give a teaspoonful of Phosphate of Lime once or twice a day for a time.

EXOSTOSIS OF THE JAW.—This consists of bony tumors on the lower jaw, where they are quite often seen.

Causes.—Usually by some external injury, ofttimes by a curb chain. Also from a small nose band to the halter.

Symptoms.—The bony tumor is sometimes spread over a large portion of the jaw bone, with very broad base; sometimes they are in the form of little lumps or nodules, the size of the end of one's thumb, with a very small base; they become hard, and usually do no harm, but are disfiguring.

TREATMENT.—

As soon as the condition is noticed, remove the cause; apply the Iodine Ointment, as in after-treatment for "Abscesses." Keep the part continuously irritated by the use of the ointment. Continue treatment for a long time. If the condition has existed for some time, it will not respond to treatment.

SPLINT.—A splint is an enlargement on the cannon bone, a little below the knee, usually on the inside, but is sometimes seen on the outside. Most often met with on the front legs, sometimes seen on the hind legs. The usual place for the enlargement is between the large cannon bone and inner splint bone above the middle. If close to the knee it is more serious. They sometimes attain the size of a hen's egg, but usually are quite small. They cause lameness while growing, but rarely do so after they are fully formed.

Causes.—Slipping, jumping, running, kicks, bruises of the bone, in fact anything that may sprain the ligamentous attachment between the large cannon and splint bones. Colts that have small, weak bones below the knee, or that are very fat and heavy on their legs, are most apt to have splints.

Symptoms.—In early stage the colt may walk sound, but trot lame. Exercise makes lameness worse; after resting a day or two, may start sound, but after going four or five miles goes lame. On examination, a sore spot may be found below the knee on inside the leg, and a little heat may be detected. Feel for it with leg bent and you will be apt to locate it. In later stages there will be a bony lump, adhering directly to the leg. When an inch or more below the knee, it is no permanent detriment, but if nearer, it is bad, as it is likely to interfere with knee action. When knee is affected, it usually causes permanent lameness. This lameness is very rarely met with in horses past six years old — most often seen at three or four.

TREATMENT.—

The more vigorous the treatment the greater tendency to the production of a permanent blemish—the bony enlargement. The treatment should therefore be mild. Give the colt a long rest; put him by himself, where he will not run and play. For a few days at first apply cold fomentations, wrap a blanket about the leg and keep it wet with cold water, re-wetting every half hour; also bathe twice a day with White Lotion (page 263). Feed laxative diet. This line of treatment requires more time, but will generally leave the animal unblemished, and if a small enlargement does form it can generally be reduced by using Iodine Ointment, as described under "Abscesses." If it is desired to remove the lameness as soon as possible, regardless of blemish, blister the part, extending the blister somewhat above and below the affected part. But little attention is paid to splints on draft horses, but on carriage and road horses a splint is a serious blemish, although the animal may not be at all lame.

SORE SHINS.—Young running horses are apt to have sore shins from too much galloping before the bones become thoroughly hardened. The bones all along the leg, from foot to knee, get sore and somewhat enlarged, causing lameness. The inflammation is often followed by an ossification of the effusion that is thrown out, and gives the leg the appearance of having patches of bone plastered over the shins under the skin.

Causes.—Too much galloping when the bones are young and tender. Bruises and kicks are often the cause of bony enlargements, and if on a joint the result may be serious.

Symptoms.—There is soreness in front legs, shown by short, stiff gait; if more in one leg than in other, there will be lameness. There is tenderness on handling, and more or less swelling at any point of injury when it is the result of an accident. At first swelling is soft and spongy, but in a few days it becomes quite hard and has the feeling of bone. Soreness may extend over the whole surface or be confined to that part near the joints, especially the fetlock and pastern. Animal is inclined to knuckle at the fetlock and go over on the knee.

TREATMENT.—

Give the animal rest. If in summer, bathe with cold salt water; in winter, have hot water. After bathing, apply freely White Lotion (page 263) and then bandage lightly with bandages wet with a solution of Hyposulphite of Soda:

Hyposulphite of Soda	4 ounces.
Water	1 pint.

A lotion composed of equal parts of Witch Hazel, Arnica, Laudanum and water, is also good to apply.

Feed on a laxative diet and give a teaspoonful of Saltpeter three times a day for a few days. Keep up treatment until soreness is gone, then, if necessary, use a light blister. The bones should never be rubbed very hard nor very much, but the tendons on back of legs may have all the rubbing they can get.

OSTEOPHYTES.—This is the name given to bony growths or deposits that follow sore shins or rheumatism. There are a number of different kinds. The velvety, or villous, like hoar frost, is usually spread over the bone in a uniform layer, and is seen in the bones of young horses, hack horses, and sometimes in the bones of driving horses. The splintered or laminated kind grows more in excrescences, and splintered as in spavin. The warty kind grows like a wart, with either a narrow or wide base. These are seen on any bone as the result of bruises or injury, and sometimes appear around the hock or knee joints.

Causes.—Hard work of any kind, making the bones sore; inflammation sets in, and deposits follow as a natural result. Accidents, bruises, kicks, etc., contribute their share. As stated, is apt to follow "Sore Shins" and "Rheumatism."

Symptoms.—The bony enlargement can be seen and felt. There will probably be, in addition, more or less lameness, or, in absence of lameness, a stiff, short, stilted gait.

TREATMENT.—

This is not very satisfactory, as it requires a long time, considerable attention, and continuous rest; and perhaps then there is no great improvement. If in early stages, the same treatment as in "Sore Shins," followed with prolonged use of the Iodine Ointment, as recommended in after-treatment for "Abscesses."

SIDE BONE.—On each side of the back part of coffin bone is a cartilage, called the lateral cartilage of the foot, and by pressing on the heel at each side of the foot just above the hoof, they can be moved in and out when in a healthy state. When diseased, they change to bone and enlarge, giving rise to the disease as above named.

Causes.—From hard work on hard roads; from any severe injury to the quarter, as horse stepping on his own feet, getting the foot caught under a root in the woods; contraction of the heels; severe nail wounds or bruising of the heels. Feet with low heels are predisposed to the disease. If the cartilage becomes inflamed from any cause, it is very apt to change to bone. Seen most in draft horses, but causes more trouble when on drivers.

Symptoms.—The quarters are enlarged upward from the hoof, hard as bone, and inelastic. In heavy horses there is no lameness if case is not severe, but if so, there will be lameness. In light horses, the lameness will be the first symptom, followed by enlargement. The rapid driving produces pain and lameness.

TREATMENT.—

Give the animal rest. Bathe the feet in cold water by applying cold water bandages, or stand in a tub of cold water. When soreness is out, paint with Tincture of Iodine several times daily,

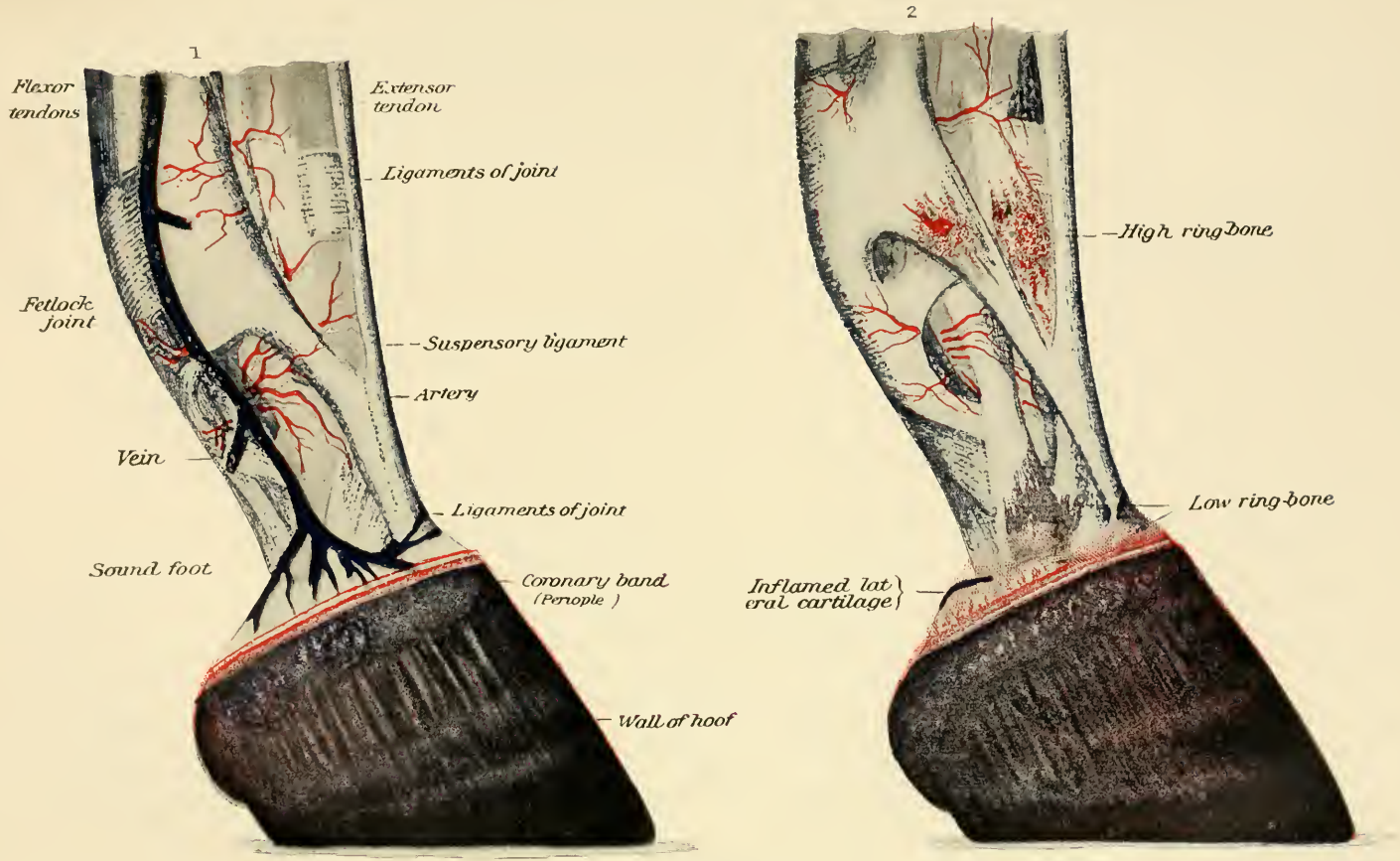
or use the Iodine Ointment as recommended under "Abscesses." Should this not cure, apply a blister, using the Spanish Fly and Biniodide of Mercury. (See "To Blister," page 257).

But little attention is paid to side bones in the draft horse, unless they are large, but in the driver they are looked upon with great disfavor. Apt to cause lameness when horse is put to hard roading.

RING-BONE.—Ring-bone is the growth of a bony tumor around the upper or the lower pastern joints. It is the result of an inflammation set up in some of the structures of the joint between the large and small pastern bones. Sometimes between the small pastern and coffin bone.

Causes.—Blows, sprains, overwork in young, undeveloped animals, fast work on the road; allowing the hoofs of colts to grow too long, or colts to follow the mare when at work, are among the principal exciting causes. Road horses with short, upright pasterns are apt to have the disease, and a long, sloping pastern in the draft horse is predisposed to it. Too high calks, or too great a shortening of the toe and corresponding high heels, when shoeing, predispose to this disease. The predisposition to the disease is hereditary.

Symptoms.—Lameness, more or less acute, is the first symptom. Besides the lameness, there is more or less heat in affected limb, with firm, though limited, swelling of the deeper tissues over seat of inflammatory process. When in fore leg the heel is placed first on the ground, a long step being taken with the lame leg, and the pastern being kept as rigid as possible. In hind leg, with ring-bone, the toe strikes the ground first, taking a shorter step with the lame leg, and pastern is kept rigid. If bony growth is under front tendon of hind leg, or if it involves the coffin joint, the heel is brought to ground first. It is not always easy to diagnose ring-bone at first—not until deposit has reached a size where it can be seen and felt. The lameness is worse on hard ground, and exercise makes worse, especially if ring-bone is in front. When the joint between the two pastern bones is affected—high ring-bone, as it is called—the enlargement will appear just above the hoof; when it affects joint between


1
Flexor tendons
Extensor tendon
Ligaments of joint
Fetlock joint
Suspensory ligament
Artery
Vein
Ligaments of joint
Sound foot
Coronary band (Perople)
Wall of hoof
2
High ring-bone
Low ring-bone
Inflamed lateral cartilage

RING BONE.

small pastern and coffin bones, it is called low ring-bone, and causes the upper part of the hoof to bulge. Low ring-bone is not met with nearly as often as high, but is more serious when it does occur. In examining to detect the enlargement when it first commences, compare carefully with the other limb, also wet the hair of both pasterns; this will make the enlargement more distinct, and if inflammation is present, the lame limb will dry off more quickly. The enlargement may eventually become very large, or remain rather small; it may be evenly distributed around the joint, or be larger at one point. The enlargement is spoken of as an exostosis.

False ring-bones are bony enlargements, which sometimes appear upon the large pastern, above where true ring-bone appears; they do not affect any joint, or cause lameness; simply an exostosis upon the bone. Treatment as for "Exostosis of Lower Jaw."

TREATMENT.—

After the inflammation starts, or in other words, the ring-bone commences, it cannot be stopped until the two bones have grown together; this is always the ultimate result—the bones grow together, the joint being obliterated. When this is accomplished, the horse will travel sound, although the blemish will remain throughout life. The treatment then is to simply hasten the growing together of the bones (anchylosis, as it is called), and this is done by blistering or firing (burning with a hot iron). The blister may have to be repeated a number of times, at intervals, of from one to two months. It is much easier to overcome a ring-bone behind than in front. Keep the animal quiet during treatment, and apply the blister to the front and side of the entire pastern. With obstinate cases the horse is sometimes nerved, but it should be a last resort; this and firing should be left to a veterinarian. To apply the blister, see "To Blister."

Ring-boned horses should not be used for breeding.

TO BLISTER.—Blistering is a line of treatment frequently used for various reasons; in case of ring-bones, spavins, splints, etc., it is used to hasten the growing together of the bones; in case of enlargements, to help hasten their removal; in case of

strains of muscles and ligaments, to stimulate the repairing process, or to remove deep inflammations. The virtue of a blister depends upon the inflammation which the irritating substances of which it is composed set up. With some the inflammation is largely superficial and answers for certain purposes; many of the strong liniments have this effect. Other substances set up deeper inflammation, which is required with some disorders, as for ringbones and spavins.

The two substances most commonly used in making blisters are Spanish Fly, or Cantharides, a pulverized insect, and Biniodide of Mercury. Turpentine, some of the acids, and other substances are at times used. The following are two blisters which will answer very nicely:

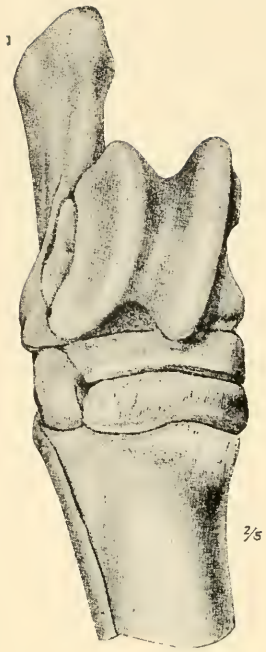
No. 1 Spanish Fly..... 2 or 3 drachms.
Lard..... 1 ounce.
Mix.

No. 2 Spanish Fly..... 2 or 3 drachms.
Biniodide of Mercury..... 1 drachm.
Lard..... 2 ounces.
Mix.

No. 2 is best for bony disorders and where enlargements are to be removed. No. 1 will answer for sprains or strains.

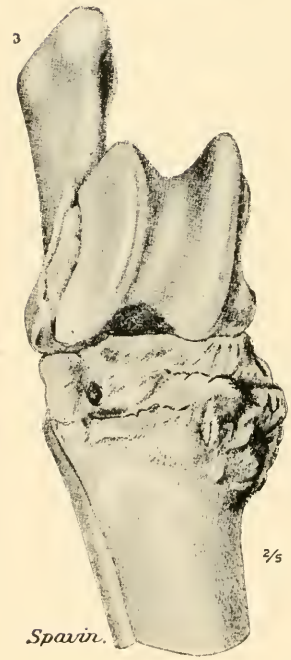
The more thoroughly a blister is rubbed in, the more inflammation will it set up and the deeper the inflammation produced.

To Apply a Blister.—The application of a blister is the same, no matter where applied. First clip the hair from the part to which it is to be applied, and brush vigorously with a stiff brush to remove the dandruff, dirt, and open pores; then apply some of the blister and rub it in, apply more and rub that in, in this way give the part a liberal application and rub for some ten minutes. Wash the blister from the hand as soon as the application is completed. Now tie the horse so he cannot lie down, by tying high. No matter where the blister is applied, do not let the animal lie down until after it is washed off, for if he does he will get it onto other parts of the body or rub the part; also tie so he cannot rub the part or get his mouth to it; if on the rear limbs, tie up the tail. The blister is left on for from twenty-four to thirty-six hours; when the desired result is obtained, the part



Sound hock.

Cured spavin.



Spavin.

Spavin.

BONE SPAVIN.

will be quite badly swollen, the stub hairs will stand erect, and the part will be covered with little blisters, which have broken and are discharging a yellowish colored fluid; the discharge should be quite free if a good strong blistering is wished. If the desired effect is produced in twenty-four hours, the blister can be washed off; if not, it can be left thirty-six, and if it is not producing as much inflammation as wished, a little more of the blister can be rubbed in and left longer. No absolute rule can be given as to the amount of the blister to use, or the length of time to leave it on, as some horses blister much easier than others. In washing off, use warm, soft water and soap, rubbing as little as possible; when the blister is all off, dry the part by pressing a clean, dry cloth against it, and then grease freely with melted lard; apply the lard once a day until the inflammation has all subsided and the new hair has come in. Do not wash the part but seldom; after the first time, need not wash at all, but keep the discharge from drying and forming a scab by the free use of lard. Carelessness in this is what produces the unsightly blemishes. A very severe blister, if properly cared for after it is washed off, will not blemish. After the blister is washed off, tie the horse so he can lie down, but so he cannot rub the part or get at it with his teeth. In the majority of cases after blistering, the animal should be kept quiet. The same part should not be re-blistered oftener than once in a month or six weeks. It will require from three to four weeks for all the inflammation to subside after a severe blistering. If the part should swell too extensively after a severe blistering, apply the grease freely and give internally a large teaspoonful of Saltpeter, three times a day for three or four days, and if this does not correct, apply cold or hot fomentations.

There are a number of blistering preparations on the market, of varying compositions. When these are used, follow the directions.

Firing produces its effect the same as blistering, it simply being more severe, setting up a deeper and more severe inflammation. Should be the last resort.

BONE SPAVIN.—Bone spavin is the name given to disease of the hock joint, in which there is inflammation of its

structures, which results in a growing together of the small bones of the hock, and the throwing out around the joint of more or less bony growth—exostosis. This generally shows most on the lower inner aspect of the joint, but may show at other places. The exostosis varies greatly in amount. When the spavin forms no enlargement, it is called an "Occult Spavin."

Causes.—As in ring-bone, the predisposition to spavin may be handed down in breeding, and horses with this disease should not be put to breeding purposes. It may be caused by sprains, bruises of the joint by kicking, jumping, running, or by hard work and fast driving. In fact anything that seriously injures the hock joint may form a bone spavin. Small, fine hocks, those that are too straight or too much bent, (cow hocks), and hocks which drop off quickly below, are very apt to become affected if put to a severe test.

Symptoms.—Horse will step shorter and strike the toe first in putting down the foot; will be noticed as lame, sometimes very bad, when first starting off after standing for a time, or over night, but when well warmed up in traveling will go all right, or at least better, as exertion causes secretion of the synovial fluid (joint oil), which lubricates the joint, and the horse is comfortable until joint gets dry by rest. If there is an enlargement, it will be more or less easily seen; if an occult spavin, there is no enlargement, but only heat and soreness. At first, enlargement may be slight, but as disease advances it will become larger, and will extend more or less, involving the bones of the hock. There is a peculiar hop to the gait, the hock being carried as stiffly as possible. A good test for the occult form is to rest the horse for a half hour after warming him up, then take the toe of the lame leg in the left hand and raise it as high as possible to flex the hock joint; hold it there for two or three minutes, then drop it and rush the horse on a smart trot; if spavin, he will go off on three legs and bring the toe down when he gets warmed up again. In a long-standing case the muscles of the hip on the afflicted side will waste away from not being properly used, after a time, but this must not be allowed to mislead. Animal will sometimes show his lameness much more in going through deep mud or snow.

In examining for the enlargement when it is small, wet both hocks with water, stand the horse squarely on all four feet, tie up the tail, and then, sitting down in front of the horse, look between the front legs and carefully compare the two joints by casting the eyes quickly from one to the other. Also compare carefully by feeling of both hocks. If both hocks are affected at the same time, which is rare, the horse will take short, stilty steps with the hind legs, acting much as though lame in the small of the back. The test will help diagnose these cases.

TREATMENT.—

As with ring-bone, treatment consists in hastening the growing together of the bones of the hock; the anchylosis cannot be stopped, but when completed, if confined to the joints between the small bones (see "Anatomy of Hock), the animal will travel practically sound; if the inflammation extends, however, to the joint between the large bone of the hock and the bone above—the tibia—anchylosis will be impossible and the lameness incurable. As with ring-bone, the treatment consists in repeated blistering; use the Spanish Fly and Biniodide of Mercury blister; apply blister to the whole hock, extending it a little above and below; keep horse quiet during treatment; repeat blister once in six weeks or two months, until two or three blisters have been applied, then let go for three or four months and then blister again if necessary. If blistering fails, firing may be effectual (see "To Blister," under "Ringbone," for the blister, and how to apply it). Put a high-heeled shoe on the foot of the affected limb. The cutting of a tendon which crosses the hock will, in some cases, prove beneficial. It would need a veterinarian for the operation.

WOUNDS AND THEIR TREATMENT

Wounds are of different kinds and are classed as follows:

INCISED WOUNDS.—An incised wound is a wound made with some sharp body. The edges are smooth, as though cut with a knife.

PUNCTURED WOUNDS.—Are those produced by the penetration of a sharp or blunt-pointed body, as a thorn, fork, nail, snag, etc., and the orifice of these are small in proportion to their depth. These are very common wounds in veterinary practice.

LACERATED WOUNDS.—Are wounds where the flesh is both cut and torn, as in a case where one horse kicks another, barb wire cuts, etc.

CONTUSED WOUNDS.—Are those where the skin is not broken, but the tissues beneath are very much bruised, as from blows of various sorts.

GENERAL TREATMENT FOR ALL KINDS OF WOUNDS.—Wounds are common, and in most cases have to be treated, at least for the first dressing, at home by those who happen to be upon the premises, owing to the urgency of the situation. Bleeding is often profuse, and when stitches are needed it is best to put them in when the wound is fresh, for not only is the stitching more painful and less successful when postponed, but after swelling and suppuration have begun, it is useless, for the edges will not unite and the stitches tear out, adding to the soreness and blemishing that follow. When the skin and flesh are laid open by cuts, calks, kicks, or in any way, the first thing to do is to stop the bleeding. The blood of the arteries is bright scarlet, and that of the veins a dark blue or purple color. When an artery is cut, apply the bandage above the wound toward the heart, to cut off supply coming down. When a vein is cut apply the compress below the wound, for the veins conduct the blood

towards the heart. The compress may be a cork bound on the artery or vein, or a wad of cotton, or a piece of dry sponge with a bandage wound over it tightly. If where a bandage cannot be used, the arteries or veins cut, must be taken up and tied. A fine pair of nippers can be used to catch the end, which must then be tied with a piece of silk. In many cases the bleeding may be stopped with Monsel's solution of Iron, with Tincture of Iron, or a solution of Copperas applied to the wound with a feather. Clean cotton batting, dusted with flour, can be bound into the wound for a time; never use cobwebs or other dusty or dirty material.

If the bleeding is not severe, flush out the wound thoroughly, first with clean water, then with Carbolic Acid lotion:

Carbolic Acid	½ ounce.
Water	1 pint.

Use a syringe to flush out with; a bulb syringe is the best. If there are any ragged pieces of tissue within the wound, cut them off with a sharp knife or a pair of scissors and sew up the wound at once, using a good, strong needle and silk thread, doubled to prevent tearing out. Make stitches one-half to three-quarters of an inch apart, and tie each one before taking another. If wound is large, put stitches in three-fourths of an inch from edge of wound, and same depth. Bring the edges of the wound just together, leaving opening at bottom for drainage. Clip off hair from edges of wound, so that none will be doubled under, and bathe with the Carbolic Acid lotion. If the wound is on the leg it is best to draw the edges together, even if they tear out, and using the lotion, bandage over wound just tight enough to hold the parts in place. When it begins to suppurate, wash with water, apply Carbolic lotion and bandage as before, but so as to let discharge escape. When stitches slough, cut them out. When wound is filled nearly to the surface with flesh, change lotion to:

WHITE LOTION

Sulphate of Zinc	6 drachms.
Sugar of Lead	1 ounce.
Water	1 pint.

Mix and shake well together.

Apply and leave off bandage. If wound is where it cannot be bandaged, use Carbolic lotion until flesh nearly fills up wound, then change to White Lotion. If bone begins to ulcerate, treat as in that affection, and if joint is affected, treat as under "Open Joint."

Special lines of treatment for different wounds will be given in connection with the discussion of that particular wound.

MODES OF HEALING WOUNDS.—Wounds heal by two methods:

1st. Healing by First Intention.

2nd. Healing by Second Intention.

The first is where the edges of the wound are brought together and they unite without any pus formation—rarely get it with the lower animals.

The second is where the edges do not unite directly, but separate a little, and the space between is filled in with new tissue, which forms the scar; with this method there is more or less discharge. With the second method, the wound should be kept flushed out with Carbolic lotion. In all cases horses should be kept as quiet as possible, fed on soft food to keep bowels free, and if there is a thickening after the wound has healed, apply the Iodine Ointment, as recommended under "Abscesses."

INFLAMMATION OF A WOUND. — This generally follows a deep punctured wound, but may occur with other kinds. The cause is generally due to germs; the wound was not kept clean, or the discharges could not escape.

Symptoms.—The wound becomes very much swollen, red and tender, and the animal may be feverish and in pain; if the wound is large, the discharges from the wound will be offensive, and more or less bloody and watery looking.

TREATMENT.—

Keep horse quiet and comfortable, and give a teaspoonful of Saltpeter in soft feed three times a day, using soft food, along with a pint of Oil, every day or two, to keep bowels free. Bathe the wound three times a day, for an hour or more, with hot water,

or wrap the part in a clean blanket, and keep this wet in hot water; or poultice. Use freely the lotions, as directed in "General Treatment of Wounds."

BLOOD-POISON.—This may arise from a wound being treated with dirty hands, or from the use of rusty or dirty instruments, or from the pus not being allowed to escape, or where animal is in dirty place; an animal in poor condition is more susceptible.

Symptoms.—The wound becomes inflamed, sore and red, begins to swell and fester, and sores are likely to form on any part of the body, which fester and break. The animal becomes dull, and weak, pulse rapid and hard, temperature rises, appetite lost, and unless condition is overcome, death results.

TREATMENT.—

Is local and internal. First, enlarge the wound, if necessary, so as to get free escape of pus, and flush out freely with Carbolic Acid lotion—Carbolic Acid, 1½ ounces; water, 1 quart; repeat three times a day. Bathe the wound with hot water for an hour three times a day, and poultice between bathings. Give nourishing, but laxative food; bran, scalded oats, a handful or two of Linseed meal, and hay. Give a clean, well-ventilated stable. Give the following:

Fluid Extract of Belladonna	6 drachms.
Fluid Extract Colchicum Seed	½ ounce.
Fluid Extract Digitalis	½ "
Alcohol	5 ounces.
Saltpeter	2 ounces.
Water to make	1 pint.

Dose: Two ounces, three or four times a day.

Also give, as one dose, three or four times a day:

Tincture of Iron	½ ounce.
Quinine	½ drachm.
Water	½ pint.

Alternate these doses with the doses of the foregoing mixture.

Ounce doses of Hyposulphite of Soda in ½ pint of water, three times a day, are also of value.

If abscesses form in other parts of the body, open and treat accordingly.

DISEASES AND INJURIES OF THE HEAD, NECK, SHOULDERS, BODY AND HIPS.

FRACTURE OF THE SKULL.—

Causes.—The skull is sometimes fractured by blows, bruises, kicks, collisions in runaways, etc.

Symptoms.—Beside the external marks of injury, there will be either stupor or delirium from the pressure on the brain, and more or less fever may follow. Later, accumulation of serum in the brain cavities, with delirium, convulsions and death.

TREATMENT.—

Get a veterinarian if possible, to raise, or trephine, and remove the portion of bone that is broken, and likely to cause pressure on the brain. Keep wound clean and treat as a simple wound. As a preventive against inflammation of the brain, give the following:

Fluid Extract Aconite Root.....	1 drachm.
Fluid Extract Belladonna.....	1 ounce.
Saltpeter.....	2 ounces.
Water.....	1 pint,

Mix, and give 2 ounces, three times a day.

Apply chopped ice and bran poultices to the head continuously for several days and nights. If he gets better, it will be in three or four days, but if fever rises and delirium increases, it will probably terminate fatally in from three to six days. (See "Inflammation of Brain.")

POLL-EVIL.—Poll-evil is a fistulous sore, affecting the bones of the neck near the top of the head or poll. Not so common as formerly, when stable ceilings were lower.

Causes.—Chafing by a heavy halter or bridle; blows on the head from the butt of a whip; from horse striking his head against a low ceiling, a low doorway, or on the roof of a car while in transit. Rearing and falling backward may cause it.

Symptoms.—There is first swelling and soreness, and the horse carries his head stiffly, for it hurts him to move that part of the neck. Suppuration sets in; the pus breaks out on the top like any abscess, but burrows down toward the bones at the same time, which, when the disease is long-standing, become diseased. There is a flow of pus, which runs down the sides of the neck; if from the muscle, it has a strong, disagreeable odor, but when bones are involved, the odor is still more offensive, as in "Caries." The pus burrows, forming channels, sometimes in a number of directions.

TREATMENT.—

If taken at the outset, the treatment is comparatively simple. Remove the cause, and bathe the parts well with hot water twice a day, and after each bathing apply the "White Lotion," and keep the horse quiet, feeding him out of a high manger, to keep parts as quiet as possible. In case there is an abscess, but no channels yet formed, open it at lowest point, so as to let all matter escape, using treatment as for "Abscesses." When channels or sinuses are formed, they must be opened up, and a free dependent opening made for the pus. It is more difficult to do this in poll-evil, than in other cases; but the sinuses usually run down into the muscles of the neck more or less. Follow and open them up freely; then, there being free connection between the top and bottom of the sinuses, wash out thoroughly, and inject with Carbolic lotion, repeating twice a day. Inject a little Tincture of Iodine into the channels once in two or three days. If the bones are affected, treat as for "Caries."

In addition to local treatment, the horse should have a physic given at the first, and be given 1 teaspoonful powdered Saltpeter three times a day in his feed.

INJURIES TO THE MUSCLES OF THE NECK.—

Causes.—From pulling back on the halter, from getting cast in the stall, or in some cases from having been bitten by another horse.

Symptoms.—There is stiffness of the neck, and swelling and soreness of parts. In some cases the neck is carried to one side.

TREATMENT.—

Bathe the parts with hot water three times a day, and after wiping dry apply White Lotion, continuing treatment until all soreness and swelling is gone. In case an abscess forms, treat as for "Abscesses."

FRACTURES OF THE BONES OF THE NECK.—

Causes.—From falling on the head in a runaway, or from stumbling; jumping a high fence and striking on the head might cause it, or it might happen in throwing an animal.

Symptoms.—If fracture causes the bones to press on spinal cord, death may occur at once by the stopping of the action of the heart. If there is only a piece from one of the bones, there will be soreness in the part and the horse will carry his head to the side the fracture is on. Any attempt to straighten the neck gives a spasm of pain.

TREATMENT.—

Keep the horse as quiet as possible, and feed him out of a high manger. Bathe the part well with hot water three times a day, wipe dry and apply a strong liniment each time after bathing, and the bones after a time will unite. If it does not heal, an abscess will form; then open, remove the broken bone and treat as an abscess.

FISTULOUS WITHERS.—This disease resembles poll-evil and takes its name from the location on the withers.

Causes.—Are often caused by bad fitting collars and saddles; by direct injuries from blows; from the horse rolling upon rough or sharp stones, or a bite from another horse. Fistulous withers are mostly seen in horses that have thick necks, and those that are very high in the withers; or, among saddle horses, those that are very low on the withers, the saddle riding forward and bruising the parts. Under these conditions, simple abscesses, if not treated in time, may become fistulae. The pus burrows and finds lodgment deep down between the muscles, and only escapes when sinus becomes surcharged, or during motion of parts, when matter is squeezed out.

Symptoms.—At first we may notice soreness or stiffness of the front legs, and upon examination of the withers, we find small, crooked lines—superficial lymphatics—running from the point of irritation downward and backward over the shoulder region. In a day or so there is swelling on one or both sides of the dorsal vertebrae; hot, painful and rapidly growing. Pain may now grow less, stiffness disappear, but swelling increases. It fluctuates on pressure, and either opens up, or its contents thickens, dries up, leaving a tumor that gradually develops the characteristics of a fibroid tumor. When enlargement is open, the cavity should be examined, as on its condition depends the treatment.

TREATMENT.—

In earliest stages, when sore, but with no marked swelling, the trouble may be frequently cut short. Give both general and local treatment. Give a physic of 1 ounce of Aloes or ¾ pound of Epsom Salts; also give 1 teaspoonful of powdered Saltpeter three times daily in the feed. Locally foment the parts with hot or cold water for an hour at a time, three times daily, and apply "White Lotion," or liniment as for "Lymphangitis." When formation of pus is evident, hasten it by the use of poultices, and as soon as fluctuation can be plainly felt, open the abscess wall at its lowest point, so that the pus will escape as fast as formed. Probe, to be sure that there are no pockets or sinuses to hold pus, or the work will not be well done. Then keep orifice open and treat as for "Poll-Evil." If the abscess has existed for some time and has not opened, the walls thickened, pus also thick, then, after opening has been made, contents washed and squeezed out, the thickened walls must be sloughed out with caustics. A very good and safe method is to tie together a number of small balls of cotton batting, leaving the string on the last from four to six inches long; saturate these with Tincture of Iodine and pack the sinuses with them, leaving the string hanging out. After twenty-four hours, remove by pulling on the string; keep flushed out with Carbolic Acid lotion and repeat the Iodine treatment as occasion requires. There must be a dependent opening for each sinus. This is sometimes best made by opening the sinus up freely, and again by passing a seton needle and tape from the

bottom of the sinus to the outside, leaving the tape in. Good judgment is needed in treating these cases; as no two are just alike, no fixed rules can be given. If the spines of the vertebrae become affected, we get symptoms of "Caries," and treatment will be needed as for that trouble. If the sinuses work down back of the shoulder blade, the treatment is still more difficult. Whenever possible, this trouble should be treated by a veterinarian, as so many varying conditions arise, that experience is needed to know how to meet them.

SWEENY—SHOULDER SLIP.—Sweeny is wasting of the muscles of the shoulder blade, leaving the spine on the blade exposed the whole length, with deep hollows on each side. It is often imagined and treated for, when the cause of lameness is very remote. It is most common among young horses.

Causes.—In plowing, when the plow strikes stones or roots, causing sudden jerks on the shoulder; by a blow from the wagon tongue when passing over obstructions, by falling and bruising shoulder; and by ill-fitting, especially large, collars, and uneven draft.

Symptoms.—Injury will be followed by a slight swelling and soreness of the part, and afterward by the wasting away of the injured muscles. In some cases the horse is not very lame, but goes a little stiff. The wasting may be confined to the muscle in front of the spine, or to the one back of it, or both may be affected. The pain comes in lifting the limb, and so the animal swings it; it is difficult for the horse to step over obstacles. To test: hold a foot plank on edge and lead the horse over it. Compare both shoulders carefully by standing directly in front of the horse, close to his head, and casting the eyes quickly from one side to the other. Care must be taken not to mistake a poorly muscled condition of the shoulder for sweeny

TREATMENT.—

If there is lameness, give rest. In early stage, if shoulder is swollen, apply cold fomentations, fasten a folded blanket over the part and keep it wet with cold water; follow this with the application of a good liniment. If wasting of the muscles, liberal

hand-rubbing with a good liniment is needed. It is well to use a small piece of stick or a corn-cob for rubbing. A very good liniment is the following:

Soap Liniment	4 ounces.
Turpentine	2 "
Strong Aqua Ammonia	2 "

Shake.

The part needs to be kept just slightly irritated with the rubbing and liniment; if it gets too sore, withhold liniment for a few days. If this fails to restore the muscles, a Spanish Fly blister can be applied. See "To Blister," page 257. A seton is also used to restore the muscles; this is a piece of tape, ½ inch wide, introduced with a large needle just underneath the skin, entering at the top, and coming out at the bottom of the wasted portion. The tape should be left long enough to be worked up and down each day, and a piece of leather tied in each end, so it cannot work out. Leave the seton in a month or six weeks. The effect of all these treatments is the same, differing only in degree—setting up inflammation, which stimulates the restoration of the muscles.

SCALDED, OR GALLED SHOULDERS.—

Causes.—Wounds of this kind are quite common during spring plowing, or from ill-fitting collars at any time of the year. Collars too large or too small may be the cause. The horse, on account of being fed scantily, and perhaps doing little, is soft and sweats easily, and if collar and shoulders are not attended to, galls and abrasions result.

Prevention.—See that the collar fits well; that the draft is distributed evenly over the whole surface; that the shoulder surface of the collar is kept clean; to keep clean, wipe off when first removed from the horse. When horses are at work, raise the collars at resting spells and let the air under them; keep the mane out from under collar, and remove the collar at noon for the shoulders to dry off. At night bathe shoulders with cold water, and afterward bathe with White Oak Bark tea, or White Lotion (page 263), to toughen the skin.

TREATMENT.—

If the bruise is severe, with considerable inflammation and swelling, give rest and foment with cold water by fastening a

folded blanket over the part and keeping it wet with cold water, re-applying the water every half hour; also bathe well three times a day with White Lotion. (See "Treatment of Wounds.") Keep up treatment until swelling is all gone, and then when put to work, place a pad on the collar either above or below the injured part, so as to remove the pressure from it for a few days. Drop the pressure back gradually, by removing the pad by layers. If the bruised part does not swell, but forms a raw sore instead, remove the pressure with the pad and use the White Lotion freely. The shoulders should be examined carefully each time the collar is removed and treatment began at first indication of irritation.

At times, dusting onto the sores of the shoulder, a powder composed of equal parts of Sulphur, Oxide of Zinc and Subnitrate of Bismuth, or one composed of equal parts of Sulphur, Oxide of Zinc, and air slaked Lime, will cause them to dry up and heal nicely.

BRUISES OF THE SHOULDER.—Horses' shoulders are quite subject to bruises in various ways. A swelling appears around the bruised part soon after the injury, and on examination it is found to contain water or serum.

TREATMENT.—

At first foment with cold water, as in preceding trouble, and when the serum forms, open and treat as an abscess. See "Abscesses."

SHOULDER JOINT LAMENESS.—Not very common, but sometimes occurs, and the seat of the trouble is usually where the large muscle of the shoulder passes down through the pulley-shaped part of the bone on the front of the shoulder joint, or the joint itself may be affected.

Causes.—A severe strain of the part, which is often caused by the horse being cast in the stall; from going through deep snow; from falling; from the kick of another horse, or any severe blow; and sometimes from rheumatism settling in the joint.

Symptoms.—When horse is walking he will swing the leg and carry the toe close to the ground; very difficult for him to step

over obstacles (see "Sweeny"). Gets worse with exercise; worse on soft ground; stumbles. In standing he will bring the foot well under him, resting on the toe, and allowing the knee to bend forward; this is to give the shoulder a rest. Horse will flinch from soreness if shoulder point is pinched.

TREATMENT.—

In all cases of shoulder joint lameness, long rest is needed, and where there is heat, swelling and soreness to touch, apply either hot or cold fomentations by applying a heavy folded blanket to the part and keeping it wet with hot or cold water, re-applying the water every half hour. Apply for three or four hours each day, or continuously, and rub well with some good liniment.

After the acute inflammation subsides, discontinue the fomentations and use the liniment, or the blister, if necessary, as in "Sweeny." Long and perfect rest is very important in connection with the treatment.

SORE BACK AND SADDLE GALLS.—

Causes.—From badly-fitting saddles, when used any length of time; from saddle sitting too far forward; from wearing a saddle when not accustomed to it. The back gets bruised, scalded with sweat, chafed with saddle, and skin rubs off in places, leaving raw sores. This applies to breast plate, or to harness saddle, as well as to riding saddle.

TREATMENT.—

Remove cause and treat as "Scalded, or Galled Shoulders."

CHRONIC SORES ON BACK OR SHOULDERS.—

Causes.—From neglecting sores on shoulders and on back. The sores show no tendency to heal and keep raw.

TREATMENT.—

Keep the horse from work. Cauterize the sores with Lunar Caustic, Tincture of Iodine, or Sulphate of Zinc; afterwards using remedies as in "Scalded, or Galled Shoulders."

SIT-FASTS ON BACK AND SHOULDERS.—These are large, calloused, tumor-like lumps on the back, as the result of saddle galls; or on the points of the shoulders, from collar galls.

Cause.—By continuing the horse at work after the parts are galled, without removing pressure or giving proper treatment.

TREATMENT.—

If small, they can sometimes be removed by the long-continued use of Iodine Ointment. See "Abscesses." If larger, will have to be removed by cutting out. If possible, get a veterinarian for the operation. To remove, make a vertical incision through the skin over the center of the tumor, then dissect the skin from the tumor, and the tumor from the muscles underneath. After the tumor is removed cut a narrow strip from each edge of the cut in the skin, so that when it is sewed up the skin will lie close to the muscles; then sew up the cut in the skin nearly to the bottom, leaving opening for drainage. See "Treatment of Wounds." The next day inject into the wound a little Tincture of Iodine, and repeat the injection every three or four days, treating as for "Abscesses." If, after the wound heals, there is a little thickening left, use the Iodine Ointment. By clipping the hair from over the tumor, and rubbing the skin well with a ten per cent. solution of Cocaine, using about ½ ounce, and waiting about fifteen minutes, most of the pain of the operation can be prevented. See "Local Anæsthetics," page 347.

The horse must be given a long rest, the part thoroughly healed, and care used when put to work again, or the trouble will return.

CRAMPS OF THE MUSCLES OF THE NECK AND LOINS—CHORDES.—This disease is of a rheumatic nature, and is most common in spring, fall, and winter.

Causes.—Exposure to cold and damp by sleeping out on the ground in wet, cold weather.

Symptoms.—There is swelling of the muscles of the neck and loins, tenderness on pressure, neck twisted around to one

side, and is stiff, so that the horse cannot eat from the ground. The animal under these conditions is stiff and sore all over.

TREATMENT.—

Apply cloths wrung out in hot water, and laid on the sore muscles. Keep horse in a warm, dry place, blanket warmly. Give the following:

Fluid Extract of Colchicum Seed..... ½ ounce.
Saltpeter..... 2 ounces.
Water to make..... 1 pint.
Shake. Dose, 2 ounces in grain, three times a day.

Feed on a laxative diet, with small dose of Oil, or Epsom Salts.

SPRAIN OF THE BACK.—

Causes.—By slips, or falls, or by having heavy objects fall on the animal's back. The ligaments, and sometimes the coverings to the spinal cord are involved, and though these are amenable to treatment, the recovery is often slow.

Symptoms.—Sprain of the back is diagnosed by pressing the thumb and finger along the spine, and by throwing the weight suddenly on the tender spot, when pain will be evinced. If, while in action, the animal is made suddenly to halt, pain is shown by back arching, or bending sidewise, and, perhaps, legs thrown under the body, as though unable to perform their office in stopping.

TREATMENT.—

Clip off the hair along the spine and apply a Fly blister, made by mixing ½ ounce of Cantharides in 2 ounces of lard. Smear the blister once daily with lard or vaseline, and repeat the treatment, if necessary. Give a long rest and run in pasture.

BROKEN BACK.—The back is sometimes broken by the fall of heavy objects, as snow or ice falling from roofs; from falls through traps or holes; or from being cast for an operation.

Symptoms.—If the spinous processes only are broken, there will not be much change in outward appearance; but the snapping or cracking that is noticed in fractures will be present, and

there will probably be some change in the straight outline of the back. If the back is broken so as to press upon the spinal cord, it will cut off all sensation and power of motion from all parts back of fracture. Prick the tail or any part back of injury with a pin; if there is no sensation, the back is injured and spinal cord pressed upon. When there is only muscular strain, while there is inability to move the hind legs, there will be sensation and ability to move the tail when pricked with a pin.

TREATMENT.—

If spinous processes only are fractured, horse will get well. Put him into slings if he can stand when raised. If not, leave him on the floor, for he will be more comfortable unless he can bear most of his weight when raised. Apply cold water cloths to fracture, and bathe with a good liniment. After active inflammation has subsided, stop the cold water and just give the horse time, allowing nature to mend the fracture. If any of the broken pieces do not reunite and continue to act as irritants, an abscess will form, and when it is soft and nearly ready to break, open enough to admit finger and take out pieces. Treat afterwards as for "Abscesses." If back is absolutely broken, so that there is displacement, loss of power in hind parts, and sensation, the horse should be killed to save suffering.

BROKEN RIBS.—

Causes.—By falling; colliding with trees, or walls while running away; from kicks from another horse, etc.

Symptoms.—If with no displacement, there will be no external change in appearance, and a diagnosis must be based on rapid breathing, breath being cool; and effort to raise the flanks to avoid working the ribs in breathing, forming a crease along the sides of the belly; unwillingness to move; and upon the horse persistently standing.

If displacement takes place there will be either a bulging in or out according to whether the ends are tipped in or out, but usually in, leaving a hollow over the break, and puncturing the pleura, in which case the symptoms will be aggravated; more evidences of pain and perhaps some bleeding at the nose, loss of

appetite for a day or two, and more or less fever, according to amount of injury done to chest and contents. The injury to the pleura will cause localized pleurisy, which may become general, and if the lining itself is injured, inflammation of it may occur.

TREATMENT.—

Put horse in a box stall and foment the injury with hot water by holding a blanket against it with a surcingle. Watch the symptoms for pleurisy, and if symptoms of it appear, treat as for that disorder. See "Pleurisy."

Should there be bleeding, treat as prescribed for under that head. Give perfect rest until horse is able and willing to take gentle exercise, which will be in four or five weeks. Two months should elapse before horse is put to work. Feed on easily digested laxative diet, bran, scalded oats, Linseed meal, hay or grass, if in season.

INJURIES TO THE MUSCLES OF THE BELLY—

Causes.—Sometimes from something that turns up and catches the muscles, from the hook of a cow, or from the kick of another horse.

TREATMENT.—

If a lacerated wound, treat as directed in "Wounds" of that class. If a puncture, examine to see that there is nothing remaining in the wound, then treat as for that class of wounds. If severe enough to allow the bowels to come out, the case is serious. If out so that horse has trampled on them, there is nothing to do but destroy the horse, but if not out much, and are not injured or blackened, throw and secure animal, wash bowels gently by pouring tepid water over them, and then a weak Carbolic solution (Carbolic Acid, ½ ounce; water, 1 quart), and push them back in place; then stitch up wound and bathe, afterward applying lotions as for wounds. If opening is large, a bandage should be put around the body to help support the stitches. Keep horse quiet and feed on soft feed till wound heals. With some animals a twist on the upper lip may control so that it will not be necessary to throw them.

STAKED.—This is not an uncommon occurrence among horses.

Causes.—From jumping fences and getting caught on stakes, from running against stakes in the field, or from injury by implement handles.

TREATMENT.—

Pull the stake out, if still sticking in the wound, and examine carefully to see that there are no pieces of wood left in the wound. There is not usually much bleeding in such cases unless the stake happens to strike a large vessel, but should there be, and the vessel cannot be tied, plug the hole with cotton batting and leave it in for twenty-four hours. Then remove and treat as for punctured wounds. Keep horse quiet until wound begins to heal, and feed soft food to keep bowels free.

HIPPED.—This is a term applied where the point of the hip bone is knocked down.

Causes.—From running through a narrow doorway and striking the sides; from falling on the hard ground, or from any injury that will break off a piece of the hip bone.

TREATMENT.—

Make the horse as comfortable as possible, and apply hot fomentations by means of blankets wrung out of hot water, and then use the following liniment:

Tincture Arnica	2 ounces.
Tincture Opium	2 "
Aqua Ammonia	2 "
Water to make	1 pint.

Mix and apply twice or thrice daily until the swelling and soreness is gone.

In case the hip swells and festers around a piece of bone that will not reunite, open and remove it, treating the same as for an abscess. Animal will remain one-sided, and will in some cases go that way, but will be as useful for common work.

FRACTURE OF THE ILIUM.—The ilium is sometimes fractured at its small part, just in front of the hip joint.

Causes.—Slipping, falling, sudden turning, etc.

Symptoms.—There will be great lameness, animal scarcely touching the foot to the ground, and if fracture of this bone is the cause, by examining, through the rectum, the side of the pelvic cavity, the broken condition can be recognized, especially if bones are displaced.

TREATMENT.—

If active and high-strung, keep the horse on his feet for a day or two, by tying his head up; then place in slings. If this is done at first, the struggles of the animal will be apt to displace the bones. If the animal is quiet, put him in a sling at once. The bones cannot be got at to set; so all that can be done is to let nature do the work. Feed soft food to keep bowels in order, and give a long rest, two to six months, to allow union of bones. The muscles of the hip will waste away more or less, but will fill up again when the horse is able to exercise. If they do not fill in, give treatment as for "Sweeny."

In the uniting of the bone, more or less bony material will be thrown out, forming a bony tumor, and if the animal is a mare, before breeding her an examination should be had to see that it will not interfere with parturition.

FALLING AWAY OF THE MUSCLES OF HIPS AFTER FOALING.—

Causes.—By mare throwing herself; by striking against something, and bruising the muscles.

Symptoms.—The animal will be noticed as stiff and sore after foaling, and in a few days there will be a falling away of the injured parts.

TREATMENT.—

Let the mare run out and treat the wasted muscles as for "Sweeny," using liniment first, and if this is not sufficient, apply a blister.

SORE TAIL FROM THE CRUPPER.

Causes.—From reining horse too high, drawing crupper too tight, or from accumulation of filth on the crupper, etc.

TREATMENT.—

Leave off crupper for a few days, and if not clean, see that it is cleaned and kept so. Slack the rein if from that cause. Treat wound as in "Scalded, or Galled Shoulders."

FRACTURE OF BONES OF THE TAIL.—

Causes.—Usually from rearing up and falling back on the haunches. Not common.

TREATMENT.—

Keep animal quiet, and if in fly season, cover animal so that the tail will not be kept in motion. If swollen, apply cold fomentations and White Lotion (page 263) until swelling is gone. Bandage moderately tight and leave it on a few days at a time while the bones are uniting. Keep horse quiet until the bones unite.

HIP-JOINT LAMENESS.—This is a sprain of the round ligament of the hip joint.

Causes.—From stepping on a rolling stone that turns and throws the leg forward; from slipping on the ice; or from falling and striking on the hip.

Symptoms.—Horse steps short on affected side, and in trotting, every time the leg is raised the hip is also raised; he gets worse with exercise. When made to stand around with the hind limbs, keeping the front nearly stationary, the same as he steps over in the stall, he will be found to be much lamer when stepping towards the side of the lame leg. The muscles of the hip waste away soon after the lameness appears.

TREATMENT.—

If a long-standing case and the joint is diseased, it is probably incurable, but if taken in time, animal may be cured by keeping him quiet and fomenting the lame part with hot or cold water, by placing a folded blanket over the part and keeping it wet; also use the liniment as in "Shoulder Joint Lameness." When soreness and swelling are out, blister (see "To Blister," page 257). Repeat blister in a month or six weeks if necessary. Put the horse in a sling if he does not lie down.

SPRAIN OF THE MUSCLES OF THE HIP.—This is, perhaps, more common than hip-joint lameness.

Causes.—By slipping while pulling a heavy load; from slipping by being pulled up too suddenly; by falling; by getting up, etc.

Symptoms.—There is swelling and soreness of the muscles; great difficulty in bringing the leg forward if those on the front of the leg are strained; dislikes very much to pull if those on the top and back of the hip are strained. When standing, horse does not always rest the leg, and only shows the lameness when in action. If one stands directly behind the animal, the swelling is more noticeable.

TREATMENT.—

Keep animal quiet; bathe well with hot water, three times daily, or apply hot blanket; after bathing, wipe dry and rub the parts well with the liniment found in "Shoulder Joint Lameness," follow with blistering, if necessary. (See "To Blister," page 257.) Give rest until thoroughly recovered.

DISEASES OF THE FRONT AND HIND LEGS

CAPPED ELBOW—SHOE-BOIL.—This is an enlargement at the point of the elbow.

Causes.—From laying the point of the elbow on the hard floor, or from lying down, so that the elbow-point rests on the shoe; or from wearing a heavy belly-band on the harness that rubs the elbow; or by bruising the elbow against the floor in springing to get up.

Symptoms.—At first a scurfy wrinkled appearance indicates the danger, and if cause is not removed, it goes on growing day by day, until a large tumor is developed. Sometimes a large, hot swelling may form in a few days, very sore to touch, which is not

usually the case with those of a slow growth. The enlargement is generally covered with hair, but sometimes it is raw, and has a proud-flesh-like growth, hence the name "shoe-boil."

TREATMENT.—

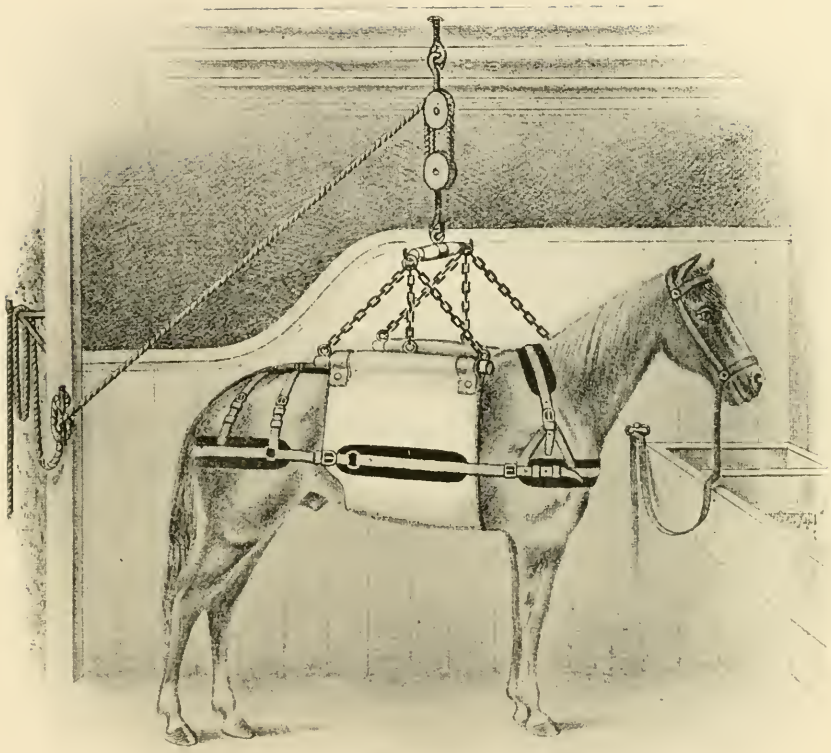
If caused by the shoe, have him shod with a short-heeled shoe, and for a time put a large pad on the leg, so that shoe cannot strike the part. When hot, sore, and of short duration, give the horse a laxative of 1½ to 2 pints Linseed oil; bathe the parts with hot water, or apply a poultice until liquid collects; as soon as this is detected, open at lowest point and treat as for "Abscess." Inject with Tincture of Iodine, and if any enlargement is left, use the Iodine Ointment. If no pus forms, continue fomenting until inflammation subsides, and then use the Iodine Ointment. If the tumor is solid, like those that occur on the shoulders, it is best to dissect them out. See discussion under "Sit-Fasts on Back and Shoulders." If a blood-vessel should be cut during the operation, pick it up and ligate. See "Treatment of Wounds." After the tumor is removed, treat as an abscess, using the Iodine Ointment to remove the thickening that is left. Sometimes, if the tumor is not too large where it joins the leg—not over two or three inches through—a string may be tied tight around it, over skin and all, close to the leg; this cuts off the circulation, and the tumor sloughs in from two to three weeks. Tighten the string occasionally. After the tumor sloughs, treat the raw spot as an ordinary sore and it soon closes in. This method causes extensive swelling, and pain.

With any of the treatments, the horse must be kept standing until wound has healed.

Nailing a two-inch plank, which is from eight inches to a foot wide, across the stall a little back of where the front feet stand, will act as a preventive against the return of the trouble; in lying down, the under side of the chest strikes against the plank and raises the body a little, preventing the bruising of the elbows.

FRACTURES.—

Causes.—Fractures with horses may arise from numberless ways, but the principal causes, perhaps, are those of running



THE SLING IN USE.

away and falling, or colliding; being kicked by other animals; getting a limb through a hole in the stable floor, or through a bridge, etc.

Fractures are divided into the following classes: Simple, when nothing else is broken but the bone; compound, when the ends of the bones pierce through the flesh and skin; complex, when the bone is shattered in many pieces, and one or more prick through; transverse, when the bone breaks straight across; oblique, when bone is broken in a slanting direction; green-stick, when bone breaks as a green stick, splitting, bending, and twisting, without breaking directly off. Bones may be cracked or broken without displacement. Bones of old horses are much more subject to breaks than those of young ones.

Symptoms.—When a fracture is suspected, manipulate with the hand and listen, and if grating of ends of bones is heard, the symptom is unmistakable. Great lameness always accompanies fracture, be it ever so slight. When the bone is only cracked, there will be great lameness, with few, if any, conclusive symptoms to indicate a break, but by careful examination a sore place can be felt; horse will not bear weight on the limb, and lifts often as though in great pain. In all cases there will be a rise in the pulse and respiration from the nervous shock and pain, more or less inflammation follows, and the temperature will be raised a little. In time, if not relieved, all symptoms increase, the nostrils dilate, the face looks haggard and anxious, the eyes sunken, the injured limb swells, becomes hot, and in all fatal cases, when inflammation reaches its height, mortification begins and extends toward the body, when death is only a question of hours. The part gets cold and clammy, a peculiar, offensive sweat appears, the skin, if white, gets purplish, but if black, discoloration cannot be seen. Pain ceases when mortification sets in.

TREATMENT.—

Treatment is rarely practical except with young, or valuable animals. If a fracture of the cannon, arm, thigh, femur, shoulder or back, it is fatal in most all cases, if displacement takes place, and especially so if a compound or complex fracture. If it is a fracture of the back, paralysis of all parts back of fracture will

ensue. In many of the above instances the horse might as well be killed. If the horse could be kept quiet many of the cases might be successfully treated, but with the swinging of the leg, and moving about, the bones will not knit. If it is the shoulder or thigh, it is so deeply embedded in muscle that it is very difficult to set the bones, especially if the fracture is oblique, for the muscles contract and draw the ends of the bones past their proper positions from two to six inches, and it is impossible to bring the ends together even with the aid of a pulley and tackle. But, if it is a fracture of the foot, pastern, fetlock, hip, or any other part where there is no displacement, a cure can usually be made. If it is desired to try treatment, put the horse in slings to take the weight from the injured leg, and to relieve the weight from the others. Bring the broken ends of the bone together in a natural position, then envelop for a distance of five or ten inches, with Plaster of Paris bandage, or if that is not handy, soak a piece of sole leather in water until soft, mold it to the form of the leg and bind it on, so as to keep it perfectly tight and solid, and in its place. Splints may be used with the leather, or a Starch bandage is good with splints. Have the starch very stiff, fill the hair with it and then begin to wind a long strip of cloth, not tight, but just so as to keep the parts in their places; put on a quantity of starch with each wind of the bandage; after making half a dozen turns, put on splints, one on each side, and one on the back, but none in front; then wind for four or five turns. If leg swells so as to make bandage too tight, slit bandage up a little way at either end. Leave on five or six weeks, keeping horse in slings, just tight enough to give gentle pressure to the belly. Talk to him, if unruly at first, and he will soon get accustomed to the conditions.

Should any pieces of bone become detached, they will act as foreign matter and must be removed. If leg is bandaged, the condition will be recognized by increased swelling in surrounding parts, and also in heat and soreness, uneasiness, and increase in temperature, pulse, and in respiration.

When the hip is broken down—"hipped"—there is nothing to do except to give time, and what constitutional treatment is indicated. Fracture of the shoulder blade is treated in the same

way, except that it might be advisable to put the horse in slings. In all cases watch the symptoms, but it would be well to give the following:

Fluid Extract Aconite Root	1 drachm.
Spirits of Niter	4 ounces.
Fluid Extract of Belladonna	1 ounce.
Nitrate of Potash	1½ ounces.
Water to make	1 pint.

Mix, and give 2 ounces, three or four times a day.

Give as long as there is high fever. Give all the cold water to drink the horse wishes, and give it often. Give liberal, but laxative, diet.

Plaster of Paris Bandage.—When the broken bone is in the leg, where there is very little soft tissue covering it, and consequently very little swelling, a Plaster of Paris splint, or cast, can be applied directly over the flannel bandage. Prepared Plaster of Paris bandages may be bought at drug stores, or they can be made by using strips of cheese-cloth or thin cotton two and a half inches wide and six feet long. These bandages are liberally sprinkled with Plaster of Paris, which is worked into the meshes of the cloth and sprinkled on its surface. The bandage is then rolled up. When ready to apply, the bandages are placed in a dish of water until thoroughly saturated, which will be shown when bubbles cease to rise. Now apply bandage over the fracture, beginning below and winding upward until a jacket is formed at least one-half inch thick. The plaster cast should extend as far above and below the fracture as is possible. It is a good plan to start the plaster bandage at the foot or at a large joint, in order to prevent its slipping down, as it is likely to do if the swelling in the part should subside. The plaster soon sets, and a very firm jacket is formed.

STRIKING THE KNEE (SPEEDY CUT).—This is a case where the animal strikes the inner, lower part of the knee with the opposite foot.

Causes.—Faulty conformation is the most prolific cause. It may happen when the feet grow too long; from defective shoeing; swelling of the leg; high knee action; and because the chest is too narrow. Horse is more apt to strike when tired.

Symptoms.—Generally the evidences of striking are easy of detection, for the parts are tender, swollen, and skin broken. There may be lameness and occasional tripping or unsteady gait, when the knee is hit. It only occurs with horses with high action, and when they trot.

TREATMENT.—

Give the horse rest; wrap a blanket around the knee, holding it in place with a strap around it above and below the knee; wet it down with fresh water every half hour, apply the whole of each day until inflammation and swelling are gone. Bathe well once a day with White Lotion (page 263), and once a day with the following:

Soap Liniment	3 ounces.
Witch Hazel	3 "
Turpentine	2 "

Shake; apply with liberal rubbing.

If it is evident that an abscess is to form, change the fomentation to a poultice, and continue poulticing until abscess points, and when covering over pus gets thin, open; use extra precaution not to have knife go too deep; have an assistant hold foot straight out in front, clasp the knife so that only a little of the point extends beyond the thumb and finger, and make the opening at the bottom of the abscess; flush out with water, then inject a little Iodine and continue poultice for a few days, and then go back to the fomentations again; inject abscess once a day until it heals, with a Carbolic Acid solution. If there is any swelling or thickening afterwards, use Iodine Ointment. (See "Abscesses.") It is very important that there be no scar or thickening left. Do not give fast roading until wound is thoroughly healed, and use a knee boot for some time afterward. Also shoe to prevent striking. Shoe opposite foot very close on the inside and with a short heel, turning inside calk lengthwise of shoe, and slant off

the inner border of the web. Spread the gait by making the outer web of the shoes much wider than the inner web, thus making the outside of the shoe heavier. During treatment give laxative diet and a teaspoonful of Saltpeter, three times a day.

BROKEN KNEES.—This term is applied to any injury to the front of the knees.

Cause.—From falling on the knees.

Symptoms.—These will vary much, depending upon the speed at which the animal is going and the kind of ground fallen upon. Sometimes there is only a little bruise and the hair brushed off; at other times the skin is cut; and again, the skin and tendons are cut, or the joint may be opened, or the bones broken. With the milder forms there may be no lameness, with the more severe the lameness will be very great.

TREATMENT.—

If the skin is not broken, apply the fomentations and lotions as in "Speedy Cut," and if an abscess should form later, treat that as for "Speedy Cut." In opening, have the leg drawn well forward, with the foot held a foot or more from the ground, so that horse will jerk away from, instead of against the knife.

If the skin is broken, clean off all dirt by syringing water into the wound; after the dirt is removed examine to see how deep the cuts are; if confined to the skin and quite long, put in a stitch or two, provided they can be put in and not stop drainage, and then follow with the treatment as above, and in addition flush out the wound daily with Carbolic Acid lotion:

Carbolic Acid	½ ounce,
Water	1 pint,

And with the White Lotion (page 263). If, upon examination, the cuts are seen to be deep, after cleaning apply a poultice and leave on twelve hours, and then remove carefully to see if there is any synovia (joint oil) on it where it contacted the wound; if joint oil is present it may be recognized by its looking much like the white of an egg, except that it is a light yellow in color. If there is no joint oil, treat as before described; if there is, treat as an open joint. See "Open Joint."

If the bones are broken, unless a very valuable breeding animal, it may as well be destroyed, for if recovery took place the knee would be stiff.

If the tendons are cut, the chances are that they will not unite, but treatment may be tried. Stiffen the knee, so as to keep the ends together, and treat the same as when the joint is not opened.

In all cases the horse must be kept standing until cured; in the severer cases he should be given a sling. Give a laxative diet, and in the milder cases give a teaspoonful of Saltpeter two or three times a day. In the most severe cases use the following:

Fluid Extract of Aconite.....	1 drachm.
Fluid Extract of Belladonna.....	1 ounce.
Fluid Extract of Colchicum Seed....	½ "
Saltpeter.....	2 ounces.
Water to make.....	1 pint.

Shake. *Dose:* Two ounces, two or three times a day.

PUFFY ENLARGEMENTS AROUND KNEES AND FETLOCKS (BURSAL ENLARGEMENTS.)—

Causes.—From striking the knees against the manger while pawing; from lying on the hard floor; or from any cause that will bruise the knees or fetlocks.

Symptoms.—There is a puffy enlargement, but not sore to handle, and it feels as if it was full of fluid.

TREATMENT.—

At first apply cold fomentations, as in "Speedy Cut;" follow this by using the Iodine Ointment, as recommended under "Abscesses." Continue the use of the ointment for a long time. Some of these enlargements can be opened the same as for "Speedy Cut," or "Broken Knees," but it best be left to the judgment of a veterinarian as to when this is practical.

KNEE-SPRUNG—This is not a disease, but the effect of one.

Causes.—From hard and fast work; from standing in a stall that has too much slope; or from feeding out of a very high rack; or from a sprain of the back tendons of the leg. Being shod with high heels will also cause it. Horses with weak, small knees are most subject to this trouble.

Symptoms—The appearance; the knees are partly bent; at first may have to stand at the side and examine carefully to detect it, but later it is very marked.

TREATMENT.–

If the animal is wanted for work, while being treated, first make the stall floor level, and feed horse from the floor. Bathe the legs with cold water twice a day; after drying, apply a good strong liniment at night and bandage for a few hours; shoe the horse with a flat shoe, if roads will allow. If horse can rest, turn him out and blister the back cords below the knee if the back tendons have been strained; above the knee, if not. Use the Spanish Fly blister. See "To Blister," under "Ring-Bone." Blister but one leg at a time, treating the other two weeks later. With cases that have been in existence for some time, the treatment will be unsuccessful. In some cases the knees can be straightened by cutting some tendons on the back of the leg, above the knee. The operation would require a veterinarian.

SPRAIN OF THE BACK TENDONS.—

Causes.—Hard driving; too oblique pasterns; slipping; too small tendons; shoeing with shoes too short at the heels; shoeing with heels lower than toe calks; allowing the toe to grow too long or cutting the heels away too much.

Symptoms.—There is more or less swelling and heat along the sprained tendons; horse will be lame in traveling; and if the cords are pressed upon, the horse will flinch. Lameness gets worse with exercise; strikes toe to ground first. Heat and swelling may be close to the knee or down lower; a very little swelling is easily recognized here, as the parts should be very clean cut. Straightens the pastern, and points with the lame foot, or may stand with knee a little sprung.

TREATMENT.—

Apply cold fomentations as in "Speedy Cut;" use high-heeled shoe; apply a good strong liniment twice each day. Give long rest. If liniment fails, apply a Spanish Fly blister. (See "To Blister" under "Ring-Bone.")

SPRAIN OF THE FETLOCK JOINT.—

Causes.—From horse stepping crooked, or turning over on his ankle.

Symptoms.—The animal will be very lame; the joint will be swollen and sore to handle. Aside from the location of the swelling, the symptoms will be the same as for "Sprain of the Back Tendons."

TREATMENT.

Give the same treatment as in "Sprain of the Back Tendons."

KNUCKLING, OR COCKED ANKLES.—The fetlocks are often knuckled forward, but this, like knee-sprung, is only a symptom of some other trouble. The fetlocks are often mistaken for the seat of trouble and are uselessly blistered and burned without benefit.

Causes.—Colts are sometimes born with this condition, but usually it is only temporary. Horses with erect pasterns are subject to this condition, especially in the hind legs. Heavy work in hilly sections; fast work on the track or roads are exciting causes of knuckling. It may be caused by disease of the suspensory ligaments, or of the back tendons, whereby they are shortened; or by disease of the fetlock joint itself.

Symptoms.—The appearance of the fetlock; it is thrown forward, partly flexed. When first coming on, it may fly back when pulling, but be thrown forward when standing still.

TREATMENT.—

In colts no treatment is necessary, unless very bad deformity is present, and then a veterinarian is needed. When knuckling is begun, relieve the tendons and ligaments by proper shoeing. Prepare the foot by shortening the toe as much as possible, leaving the heels high; or if the foot is prepared in usual way make the shoe thin in front and with thick heels or high calks. A long-heeled shoe with high calks is best for the hind feet. In the early stages, as soon as the weakness shows, give rest and treat the fetlock or back tendons, in whichever the trouble lies, as for "Sprain of the Back Tendons." If the fomentations and liniments do not relieve, blister the parts. In cases of long-standing, treatment will fail to relieve.

INTERFERING, OR STRIKING THE FETLOCKS.—An animal is said to interfere when one foot strikes the opposite leg in passing, during locomotion. It is seen more often in the hind than in the fore legs. It causes a bruising of the skin and deeper tissues, and usually there is abrasion of the surface. Lameness, tripping, and thickening of the parts may result.

Causes.—Are sometimes from shoeing with too heavy a shoe, and making a long trip before horse is used to it. Faulty conformation is the most prolific cause, which shoeing will largely correct; too long feet; rough, slippery roads; weakness; exhaustion; fast work; or from narrowness of hips.

Symptoms.—The injury, and in severe cases, lameness.

TREATMENT.

Rest. Foment as in "Speedy Cut"; apply the White Lotion (page 263) freely. After sore is gone, use pad for some time when driving, and shoe as in Speedy Cut to spread action.

WIND-GALLS.—Joints and tendons, where they rub against another part, are furnished with sacs containing a lubricating fluid called synovia (joint oil). When this sac is overdistended at the fetlock by reason of excessive secretion of the fluid, it puffs out on each side at the back upper part of the joint; the back tendons prevent it from projecting straight, and so get the double puff. The condition is commonly called "Wind-Galls." It may affect either front of rear limbs.

Causes.—Are often seen in young, over-grown horses, seemingly from too much weight for limbs; from heavy work; excessive knee action; hard roading. Horses used to start heavy loads on slippery streets are apt to have wind-galls in the hind legs.

Symptoms.—The lump is more or less tense when foot is on the ground, but soft when picked up. They generally come on slowly and cause no inconvenience. If caused by excessive strain of the joint, they develop rapidly, are tense, hot, and cause more or less lameness; horse stands with joint flexed; walks with short steps, the toe coming to the ground first.

TREATMENT.—

The trouble in colts generally disappears after a time without treatment. If due to severe strain, rest, and apply a high-heeled shoe. Foment with cold water, and rub well twice a day with a good liniment; after the acute stage, use the Iodine Ointment. In cases of long-standing, nothing can be done, unless there is lameness, in which case blister. See "To Blister" under "Ring-Bone."

THICKENING AROUND THE FETLOCK.—

Causes.—This is generally from hard work, and from strains of the joints, interfering, etc., and is often seen in livery horses.

TREATMENT.—

Apply cold fomentations and liniments, with liberal hand-rubbing; if these fail, use Iodine Ointment. See treatment for "Abscesses" for the ointment.

BREAK-DOWN—RUPTURE OF THE SUSPENSORY LIGAMENT.—This ligament extends from the knee to the fetlock, between the back tendons and the large cannon bone. This may occur in both the fore and hind legs, and is seen in horses of all ages. In old animals, especially hunters, runners and trotters, the seat of trouble is nearly always in one or both front legs. In horses of heavy draught, the ligaments of the hind legs are the ones most affected.

Symptoms.—When both branches are torn from their attachments to the sessamoids, or both are torn across, lameness comes on suddenly and is most intense; the fetlock descends, the toe turns up, and as the animal attempts to walk, leg has the appearance of being broken off at the fetlock. These symptoms are followed by heat, pain, and swelling of the parts at point of injury. In milder cases, fetlock will descend only a little, and if simply a strain and not a complete rupture, will get symptoms as in "Sprain of the Fetlock Joint."

TREATMENT.—

When rupture has taken place, put the horse in a sling, put a large wad of cotton at the back of the pastern and bandage tightly

to help keep the part in place; or, better, put a long-heeled shoe on, fasten an iron band between the heels, bent the right shape and extending up the back of the cannon and fasten it below the knee with a strap; put a pad under the end so it will not irritate the leg. Get the leg up into as nearly a natural position as possible. Foment and use liniments as in "Sprains of Back Tendons;" afterwards blister. Long rest will be necessary to effect a cure, and the animal will always be more or less weak.

SPRAIN OF THE STIFLE JOINT.—A strain of the ligaments of the stifle joint.

Causes.—Slipping is the most common cause, although the joint may be injured and inflammation set up in other ways.

Symptoms.—Animal cannot bring the leg forward, and it is very sore when you press around the joint; also swollen the swelling being more or less puffy.

TREATMENT.—

Bathe twice a day for an hour or more with hot water and vinegar with a little salt in it; after bathing, wipe dry and apply any good strong liniment (see back part of book). If this fails, blister (see "To Blister," under "Ring-Bone.") Give long rest, and in severe cases give the animal a sling, so he will not have to lie down and get up. Much inflammation in this joint is always serious.

DISLOCATION OF THE PATELLA, OR STIFLED.—In this case the patella, or knee cap, slips out of the pulley-like process in the bone in the front part of the stifle joint, and as soon as this slips out, it locks the joint so the animal cannot move it.

Causes.—Dislocation is caused by a slip and twist at the same time, the weight probably being upon that leg at the time. The horse recovers from the slip and finds himself with the leg as far back as it can be, having carried the body forward on it, and when ready to bring the leg forward he is unable to move it. The leg remains extended backwards until help comes to relieve the situation.

Symptoms.—Are as above described. The other legs move all right, but the one remains with foot extending backward in one position, as though fastened to the ground. There will be an enlargement on the outside of the stifle, as the patella always goes outward.

TREATMENT.—

In most cases this is simple. Have the horse's head held and let some one pull forward on a rope fastened to the pastern of the affected leg while the hand is placed against the enlargement at the joint and shoved in toward the animal, and forward, as hard as possible, until the bone goes into its place, after which the animal is put in a single stall, tied so he cannot lie down, and the joint rubbed with some good strong liniment twice a day for a few days, and then it is generally best to blister the part, applying the blister to the outside and inside of the joint; the inside blisters easily, however, and does not need much rubbing. Use the Spanish Fly blister. See "To Blister," under "Ring-Bone."

PARTIAL DISLOCATION OF THE STIFLE JOINT.—This usually occurs in young foals when running on rough grounds, or in colts in the spring, when they are weak, but sometimes later in life.

Symptoms.—At first when noticed, the stifle will slip out and the leg will be locked for a few steps, then it will slip in with a snap, and he will be all right again. Sometimes there will be a catch, as it were, followed by the snap. If allowed to go on, the bones will become diseased and weakened, and the patella will get part way out and enlarge the groove. The joint will get larger than natural, and the horse will never have proper action again.

TREATMENT.—

Put the animal in a single stall, tie so he cannot lie down; secure foot forward by fastening a strap around the pastern, and running a rope from it under a surcingle, and tying to a strap about the neck; tie so the leg is kept just a little ahead of the other one, and then blister as in the preceding. Keep standing

for two or three weeks. A sling can be used to rest the animal. Follow with long rest in small enclosure. Long-standing cases are incurable.

CRAMP OF THE MUSCLES OF THE THIGH.—These are sometimes affected with cramp in hard-worked horses, especially old ones. They are often incorrectly diagnosed, being mistaken for dislocations of the stifle, and in fact are rarely recognized except by an expert.

Causes.—Very severe exertion, especially if prolonged; muscles become fatigued, and the nerves in them irritated; then, if forced to continue work, cramp is very likely to take place. Sometimes horses, when swimming, are seized with cramps.

Symptoms.—Horse will seem all right, except that he is laboring from fatigue, when suddenly one or both legs will cramp, and muscles draw all into knots; a constriction will be seen in the hollow of the thigh; point of hock is drawn up, and horse crouches with hind parts. Horse is drawn up and unable to move. When both legs are affected, horse falls in agony, not being able to stand. When one is affected, it is usually drawn upward and backward; he is unable to extend it. May pass off soon, or last for several hours.

TREATMENT.—

Get hot water as quickly as possible and apply it, bathing the parts until muscles relax and leg is let down, when the horse walks as well as ever. Then rub dry and apply the following liniment:

Tincture of Arnica	2 ounces.
Tincture of Opium	2 "
Aqua Ammonia	2 "
Water to make	1 pint.

Mix, and apply.

In absence of liniment, Tincture of Camphor, Arnica, or hot vinegar, are good. Give patient a few days' rest.

SPRAIN OF THE MUSCLE ON FRONT OF THE HIND LEG, BETWEEN THE HOCK AND STIFLE JOINT.—This is a sprain of the what is called the flexor metatarsi.

Symptoms—The muscle will be swollen and sore; in moving the horse forward, when he lifts the leg and attempts to bring it forward, instead of going forward, it will go backwards and upwards.

TREATMENT.—

Keep the horse quiet and treat as for "Sprain of the Back Tendons."

SPRAIN OF THE MUSCLES OF THE INSIDE OF THE HIND LEG, RUNNING UP FROM THE HOCK.—

Causes.—From a severe sprain of the leg, by slipping outward when pulling a heavy load.

Symptoms.—There is a thickening of the muscles above the hock, and the horse will be stiff for a few days; the stiffness will soon disappear, but if not treated, there may be a permanent thickening.

TREATMENT.—

Let the animal rest from work, and treat as in foregoing.

BOG SPAVIN.—This is an enlargement, or distension, along with inflammation of the synovial membranes of the hock joint, partly on the inside and partly on the front. There is an excess of joint oil (synovial fluid) secreted, and this bulges out the capsular ligament at this part of the joint.

Causes.—From severe sprain of the joint; from jumping, kicking or being kicked; from pricks by forks; or nails in stall when horse may be kicking.

Symptoms.—There will be a large, soft swelling on the front and inner side of the hock, just a little above where the enlargement for bone spavin occurs. It is of the same character as "wind-galls;" seems filled with air, but it is joint oil, or synovia. In mild cases there is little lameness, but in bad cases there is lameness, resembling that of bone spavin, the animal getting better with exercise.

TREATMENT.—

First try fomentation, along with liniment and liberal hand rubbing as for "Sprain of the Back Tendons." If this, with rest, does not affect a cure in three or four weeks, blister, using Spanish Fly and Biniodide of Mercury. (See "To Blister" under "Ring-Bone.") If blistering fails, firing may be tried. In many cases, treatment is unsuccessful.

HYDRARTHROSIS.—A condition affecting the hocks of large, over-grown colts, the appearance of which is the same as bog spavin, except there is no lameness; there is the same puffy enlargement on the inner front aspect of the hock. The enlargement generally disappears as the animal reaches maturity; if treated at all, use only some mild liniment, as equal parts of Soap Liniment and Witch Hazel, with lots of hand rubbing. Do not break colt until fully matured. Never use more severe treatment unless lameness develops, and then treat as for "Bog Spavin."

THOROUGHPIN.—This is of the same nature as bog spavin—a distension of the synovial bursa—but is found in the back part of the hock.

Causes.—It is produced by many of the same causes that produce bog spavin; is most often seen in horses that do hard work, as draft, hack, and stage horses, and those of general utility. It is often seen in stallions, from weight thrown on hind legs, and in colts that are large and heavy for their age.

Symptoms.—There are two puffs, one on each side of the hock, at the bottom of the depression in front of the point of the hock. If one is pressed against, the one on the other side becomes larger, and if there is bog spavin, as there frequently is, if the puff in front is pressed against, both the thoroughpin enlargements will increase in size, showing that a thoroughpin and bog spavin affect the same synovial sac, but at a different place. When lameness is present it is the same as in bog spavin.

TREATMENT.—

The same as for "Bog Spavin." When the puffs appear in young, rapid-growing colts treat as for "Hydrarthrosis," under "Bog Spavin."

CAPPED HOCK.—The point of the hock is liable to injury, giving rise to swellings of the nature of a tumor. It is filled with a watery fluid, slightly tinged with blood. If not emptied and properly treated they become calloused and changed into a solid, fibrous mass in a month or so. The callous on the hock never gets so large as on the elbow, but it is just as hard and unsightly, and far more noticable.

Causes.—By kicking either in stall or in harness; by sitting on haunches in getting up; sometimes by runaways; or by being struck by timber falling on the hocks, or by the breaking of an evener.

Symptoms.—The points of the hocks are found to be much swollen; hot and sore to the touch if examined soon after the injury; later the enlargement becomes puffy like a sac of water, caused by a serous fluid collecting under the skin; occasionally the fluid is synovia. Sometimes the enlargement is hard and firm.

TREATMENT.—

In the early stages fasten a folded blanket about the hock and keep wet with cold water; keep on throughout the day and bathe well night and morning with White Lotion (page 263); after the acute symptoms have abated, use the Iodine Ointment, as recommended under "Abscesses." If this treatment fails and a fluid collects, open at the bottom and treat as an "Abscess." Use the Cocaine solution in opening (see OPERATIONS). After opening, inject a little Tincture of Iodine, and flush out once a day with Carbolic Lotion. If proud flesh forms at the opening, use Sulphate of Zinc on it. Use the cold fomentations after opening, to keep down the swelling, and afterward use the Iodine Ointment to remove any thickening.

SPRAIN OF THE HOCK JOINT.—

Causes.—Severe slipping, or by getting the foot caught.

Symptoms.—Horse is very lame, and keeps the hock stiff in bringing the leg forward. There is swelling and heat around the joint.

TREATMENT.—

Foment the hock during the day with hot or cold water, by wrapping a folded blanket about the hock and keeping it wet. Night and morning apply some good liniment. Later, if lameness still continues, blister. Spavin is quite apt to develop; if so, treat as under "Spavin."

FRACTURE OF THE BONES OF THE HOCK.—Fractures of the bones of the hock are not very common.

Symptoms.—Horse will be very lame; will hold up leg with pain; joint will become swollen and sore to touch, and by manipulation the grating of the bones may be heard.

TREATMENT.—

If very bad, there is no remedy, and horse had better be killed. If horse is young and break is not bad, and confined to small bones in the lower part, put him in a sling, with just pressure enough on the belly to ease the weight on the legs, and apply a splint if necessary (see "Fractures"). If the splint is not necessary, use fomentations to keep down part of the inflammation; after five or six weeks, blister as for "Spavin," and repeat if necessary.

BLOOD SPAVIN.—This is the enlargement of a vein which passes over the front of the hock. The symptom is the enlargement fading above and below into the vein. Do not attempt to treat.

OPEN JOINT.—This is one of the serious injuries that horse-flesh is subject to, and it is not uncommon.

Causes.—Cuts, bruises, pricks from nails, from a fork in handling manure and bedding, falling on the road, and kicks from other horses, are common causes.

Symptoms.—There is the wound, lameness, swelling around the injured joint, and leaking from the puncture of an oily-looking fluid, which is the synovia, or joint oil. In some

cases the flow of synovia is so slight it cannot be detected; in such cases apply a poultice, leaving it on twelve hours, and upon taking it off the synovia can be seen on the poultice, if the joint was open. The synovia is yellowish, as thick as the white of an egg, and slippery feeling.

TREATMENT.—

Put the horse in a sling to help keep the joint quiet. If the wound is large, first clean by pouring water over it, and then pour over it Carbolic Acid solution, but do not inject into it; if stitches are necessary, put them in, but do not sew up tight; stiffen the joint with a splint and apply a poultice at night, and keep on, during the day, heavy clean bandages wet with cold water; at night bathe the joint well with White Lotion (page 263), and in the morning bathe well with a lotion composed of equal parts of Witch Hazel and Soap Liniment. If the edges of the wound commence to look red and angry, dust on a little burned Alum. Continue treatment until after the opening closes and the discharge stops; after this, continue the cold fomentations and rub well with a strong liniment. If the lameness continues, blister, using the Spanish Fly and Mercury blister (see "To Blister," under "Ring-Bone"). Do not attempt to close the opening into the joint quickly; let it close gradually. Internally give the following:

Fluid Extract of Aconite	1 drachm.
Fluid Extract of Belladonna	1 ounce.
Fluid Extract of Colchicum Seed	½ ounce.
Saltpeter	2 ounces.
Water to make	1 pint.

Shake. *Dose:* 2 ounces, two a three times a day.

Depending upon the amount of fever; give for a week, discontinue for a few days, and then give again if necessary. Feed on laxative diet, giving a handful or two of Linseed meal three times a day, and grass if in season. If the appetite keeps good, temperature remains near normal, joint does not swell badly, and limb is held quiet, the symptoms are favorable; if, however, appetite is lost, fever high, limb badly swollen, and limb kept swinging, the symptoms are unfavorable, and treatment needs to be applied more vigorously, if possible; in the later case death is apt to follow.

CURB.—This is a strain and an enlargement of a ligament on the back of the hock a little below the point. It is seen in the form of a bowed section, about four inches in length; sometimes it is swollen up as thick as an inch from the healthy form, and at other times it is hardly noticeable. When in the inflammatory stage the disease causes lameness, but when the swelling is once hardened it seldom does. It is most commonly seen in sickle or cow-hocked horses.

Causes.—A sprain of the ligament at the back part of the hock; by getting the hind feet too far under the body; stopping suddenly and feet slipping under; rearing; backing heavy loads, etc.

Symptoms.—Standing at the side of the horse and opposite the hind parts, and looking across the legs, you will notice a curve on the back and lower portion of the hock, instead of a straight line as in a healthy leg, from the point of the hock to the fetlock. In recent cases there is lameness, heat, soreness to touch, and, like all sprains, it grows worse with exercise. In moving, the horse strikes the toe to the ground first.

TREATMENT.—

If near a blacksmith shop, have a high-heeled shoe put on; then wrap the joint in a folded blanket and keep it wet with cold water, applying fresh water every half hour; once a day bathe freely with White Lotion (page 263), and once with a lotion composed of equal parts of Witch Hazel and Soap Liniment; continue until lameness subsides, and then use Iodine Ointment to help in removing the enlargement (see under "Abscesses"). If the above fails to effect a cure, blister, using the Spanish Fly and Mercury blister. (See "To Blister" under "Ring-Bone.")

CUTTING THE BACK TENDONS.—The back tendons of the hind leg are sometimes cut by the horse backing up onto something sharp, as mower knives, scythe, corn-cutter, etc.

Symptoms.—The appearance; a wound in the back of the leg between hock and fetlock, and if both tendons are cut the fetlock descends so that the horse walks on the back of the pastern; and upon examining the wound the separated ends of the cut tendon can be seen.

TREATMENT.—

Bind a large wad of some material on the back of the pastern to keep it from going down so far, and get the animal to the stable; then put on the long-heeled shoe, and attach an iron to extend up the back of the leg, as with "Break Down." The leg must be supported in its natural position, so that the cut ends of the tendon will come close together, otherwise, when they unite, they will be too long, and the fetlock will go down too low; dress the wound with White Lotion (page 263) and the Carbolic solution. Bandage it loosely, but in putting bandage on and taking it off, do so gently, so as not to disturb the tendons. If proud flesh starts to form, keep it down with burned Alum or Sulphate of Zinc. Put the horse in a sling at once, and keep him there until the part is entirely healed and strong, which will take from six weeks to two months. Feed on light, laxative food. If the limb seems to be weak after the parts have healed, apply a mild blister.

RUPTURE OF THE MUSCLES.—

Causes.—Muscles are sometimes ruptured across the fibres by over exertion, severe sprains, etc.

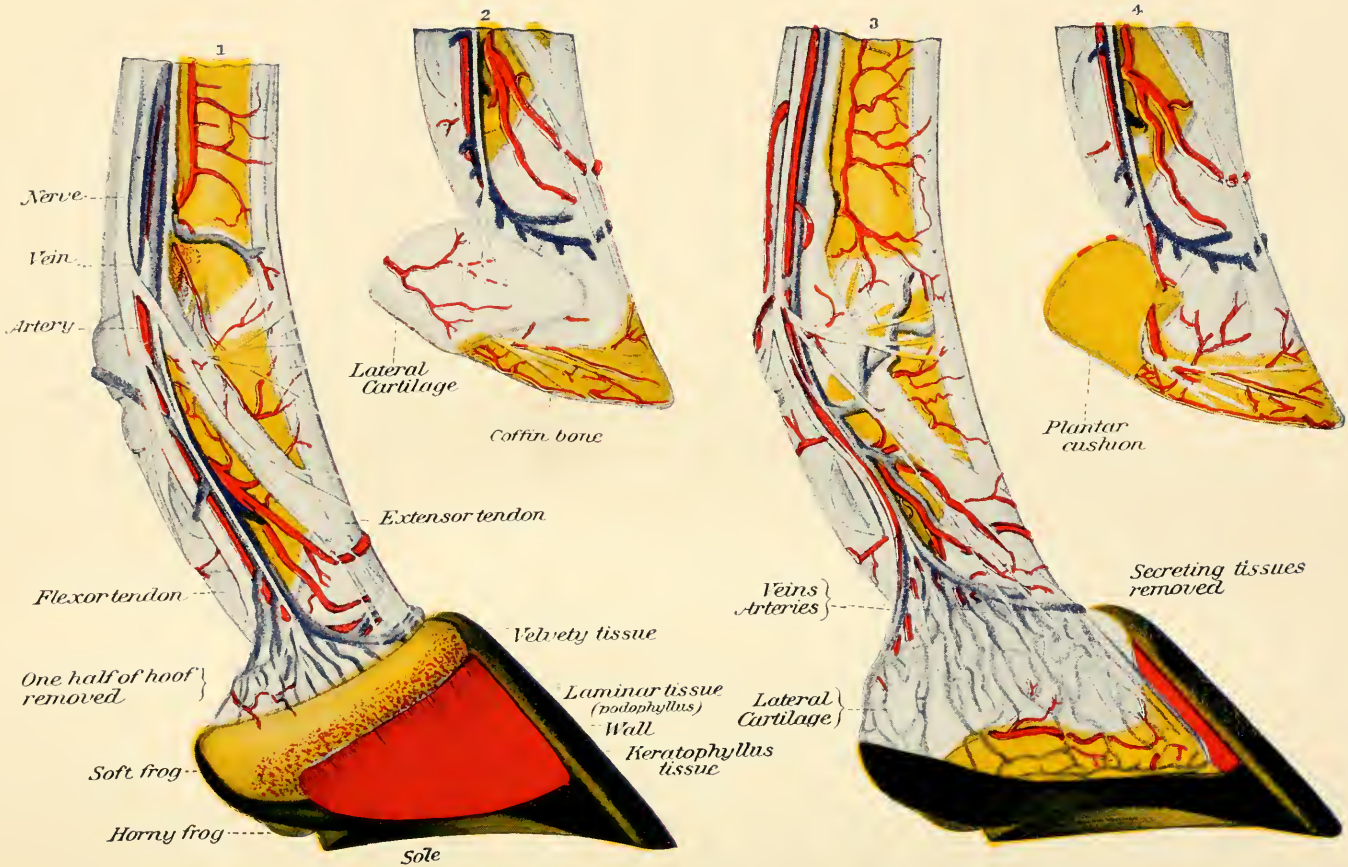
Symptoms.—Great lameness is noticed as an early symptom. Swelling, heat and soreness follow in from two to six hours after an injury. There is unwillingness, amounting to inability, to move the affected part. When inflammation has subsided and swelling is gone, there will be a depression in the muscle at the seat of injury.

TREATMENT.—

During the active inflammation, apply hot fomentations as continuously as possible, and also apply, three times a day, the following anodyne lotion:

Soap Liniment	4 ounces.
Tincture of Arnica	3 "
Tincture of Opium	3 "
Witch Hazel to make	1 pint.

When inflammation has gone and the muscle depression is formed, apply strong liniments or a blister, as for "Sweeny."



ANATOMY OF FOOT.

ATROPHY OF THE MUSCLES.—This is a wasting away, or shrinking, of a muscle or group of muscles, leaving a flattened or hollow surface in the place of the normal fullness.

Causes.—Sprains, strains, bruises, severe pressure, are principal causes. Inaction of a muscle will also produce it.

Symptoms.—A flattened or hollow place will be found in the place of the muscle. Compare with corresponding muscle of the other side, and the difference is easily detected.

TREATMENT.—

Treat with strong liniments, friction, blisters, and seton, if necessary, as recommended under "Sweeny." It is an atrophy of the muscles which has to be overcome in that disease.

DISEASES OF THE FEET.

QUITTOR.—This is the name given to a disease of the foot, when the festering of any sore works up through, and breaks out on top of the foot at the junction of the hair.

Causes.—It is usually the result of a neglected corn, prick of a nail, gravel getting into nail-hole, or a severe, poorly cared for wound at the top of the hoof, working downward.

Symptoms.—It usually occurs on the quarters, anywhere from the heels to two or three inches forward, but is oftener seen on the inner quarter, because most corns are found there. After horse has been lame some time, it makes its appearance by swelling at the coronet, which may reach the size of a hen's egg. In the course of a day or two it breaks and discharges matter, when horse will be relieved of some of the pain, which is intense during the formative period. Sometimes foot can scarcely be put on the floor, and may be paining most of the time. When the sore has been discharging two or three days, the flesh around opening will turn purple and soft, and the matter will spread, extending each

way, but more toward the front. In a couple of weeks, pipes will have formed, pointing downward in all directions, having one common center in the opening at the top. If let alone, the walls of the pipes will thicken and harden, and enlargement at the top increase in size. If allowed to run for three months, the foot becomes so full of pipes and so large, hot, and painful, as to require very persistent treatment to stop disease, and it can never be reduced to natural size again. In extreme cases lameness is permanent, the toe turns up, and horse walks on his heel.

TREATMENT.—

If taken as soon as it breaks open at the top, poultice the foot for twenty-four hours to soften the parts. Then give the diseased part vent at the bottom to allow matter to run out if it will; but if none is found at the bottom, do not cut hoof to make it bleed, as that would only make another sore. Open freely at top and probe with a smooth probe to find depth and direction of hole. Then follow the probe with a knife, and open right out and down the hoof, as far as the hole goes, taking out a V-shaped piece of the wall to allow escape at the bottom, instead of making it come out of the top. Then sponge out with warm water to cleanse it, and follow with a lotion made as follows.

Sulphate of Copper..... 2 drachms.
Water..... ½ pint.
Mix, and inject well down into the wound.

Also flush out twice a day with the Carbolic lotion. If after a week the wound does not appear to be doing well, change the Copper lotion to the following:

Sulphate of Zinc..... 3 drachms.
Water..... ½ pint.
Mix.

See that the opening is down at the bottom all the time to let the matter out. Foment or tub the foot the most of each day, and poultice part of the time at night. Keep the shoe off until the foot is well enough to work; then put on a bar shoe to protect the weak quarter.

In very bad cases, where several pipes are running in as many directions, it is absolutely necessary to open each one fearlessly. Then go on with lotions as above, and change occasionally to the following:

Corrosive Sublimate..... 15 grains.
Water..... 1 pint.
Mix, and inject.

In long continued treatment it is advisable to change the lotions every week. On account of inflammation, foot will grow faster, and it should be pared down occasionally. When discharge is dried up and disease cured, apply Iodine Ointment to the enlargement to reduce it (see "Abscesses"). It is also well in some cases to apply a blister. (See "To Blister," under "Ring-Bone.")

SEEDY TOE.—This is a dry, mealy condition of the wall of the toe.

Causes.—By bruising of the toe, by the clip of shoe being pounded into toe too tightly; the bruised parts take on a sort of dry rot, or gangrene, which extends up between the wall and the laminae. It may occur at other parts of the foot than the toe, from various causes. It is a separation of the two layers of horn which compose the crust of the hoof, resulting from disease due to bruises or faulty condition of the body.

Symptoms.—When shoe is removed, a mealy, whitish-looking substance will be seen immediately under the wall, at the toe, running up toward the hair, sometimes an inch or so, and may be picked or broken down easily with a nail, leaving a hollow beneath the shell.

TREATMENT.—

Pare away the wall at the toe, after removing the shoe, so as to take the bearing therefrom. Pick out all the mealy substance that breaks down easily, and turn in warm tar and press in a little wad of tow. Replace the shoe, and apply a mild Spanish Fly blister to the coronet. (See "To Blister," under "Ring Bone.")

CONTRACTIONS OF THE FOOT.— This is most always the effect of some other disease, especially when bad, such as navicular disease, corns, sprains of the tendons, ligaments and muscles of the legs or shoulders. Any long-standing lameness is always attended with more or less contraction of that foot which is favored. It may also be the result of bad management in the stable or blacksmith shop. Leaving shoes on for six, eight or twelve weeks is a prolific cause of the trouble, as is allowing the feet to become very dry by standing on a plank floor too much of the time.

Symptoms.—The horse is lame; if it accompanies some other disease, the lameness will be characteristic of that disease, and there will also be a contraction of the foot, especially at the heels. The hoof will also be hard and dry. If the result of poor care of the feet, and both are affected, the action will be stilty, striking the toes to the ground first, and there will be the narrow heels and dry, hard hoofs.

TREATMENT.—

If the shoes have been on a long time, have them removed and the feet dressed as for shoeing, but do not cut them too much; then soften up the feet by fomenting, tubbing, or standing in a clay puddle (see OPERATIONS). The clay puddle is perhaps the best. After the feet are well softened, have the horse shod with bar shoes, giving quite a little frog pressure and leaving out the heel nails in nailing the shoe on; continue the fomenting, allowing him to stand in the water or puddle two or three hours each day. Turning in a low pasture is also good. After the bar shoes are put on, the animal may be given slow work. After the above treatment has been continued for two months, if there is still lameness that is not improving, apply a Spanish Fly blister to the pastern from hoof to fetlock. (See "To Blister," under "Ring-Bone.")

GRAVEL IN THE FOOT.—

Causes.—Gravel is apt to work up into any sore in the foot, and cause much trouble. It may get into a corn, or a nail hole made in shoeing, or by one picked up on the road getting under

the shoe and working up through the foot. It may get into the quarter crack, calks, or in other wounds, and it always causes increased inflammation, by aggravating existing affection.

Symptoms.—There is lameness, oftentimes very severe, for which there seems to be no cause; by removing the shoe and examining the foot carefully, may find where gravel entered. After a time there appears a swelling at the coronet. It is very sore, gets larger and finally breaks, allowing gravel to escape. The lameness improves rapidly, often times entirely disappearing in a few days.

TREATMENT.—

As soon as gravel is suspected, poultice the foot, continuously, changing morning and night; this hastens the removal of the gravel; soon after the enlargement appears at the coronet it may be opened and the process hastened somewhat. After the gravel escapes treat the wound as for "Calking," continue the poultice for two or three days, and keep the hole well flushed out. If poorly cared for, a quittor is apt to form.

CANKER IN THE FOOT.—Canker of the foot is a disease due to the rapid reproduction of a vegetable parasite. It not only destroys the sole and frog, but by setting up a chronic inflammation in the deeper tissues, prevents the growth of healthy horn by which the injury might be repaired. Heavy cart horses are more affected than any other class.

Causes.—The essential element in the production of cankers is, of course, the presence of the parasite; consequently the disease may be called contagious. But as in all diseases due to specific causes, a suitable soil must be found in which to grow, before they can be reproduced. Dampness is a favorable condition. Filthy stables; muddy roads; and injuries to the feet that expose the soft tissues, are predisposing causes.

Symptoms.—Usually canker attacks one foot; it may attack two, three, or all of the feet at once; or, as is more commonly seen, the disease attacks first one, and then another, until all may have been successively affected. When disease follows injury which has exposed the soft tissues of the foot, the wound does

not heal, but instead there is secreted a thin, watery discharge from inflamed part, which undermines and destroys the surrounding horn, until a large part of sole and frog are diseased. The living tissues are swollen, dark-colored, and covered at points with new, soft, yellowish, thready horn, which is constantly soaked in the abundant secretions. As this secretion escapes to surrounding parts, it dries and forms small, cheesy masses, composed in part of the partly dried horny matter, exceedingly offensive to smell. When disease results independent of injury, the first evidences are the offensive smell, the liquid secretion from cleft and sides of the frog, and the rotting away of the horn of frog and sole.

TREATMENT.—

First clean the foot with warm water, and then apply a poultice containing either a handful of charcoal, or a tablespoonful of Carbolic Acid. The diseased portions of horn are now to be carefully removed with sharp instruments until only healthy horn borders the parts. Pare edges of sound horn thin, so that the swollen, soft tissues may not overlap their borders. Cut off all prominent points of the soft tissues, shorten the walls of the foot, and nail on a broad, plain shoe. Give the newly shod foot a bath for an hour or two a day in a solution made by adding 2 ounces of Sulphate of Iron to a gallon of water. Also use freely the Carbolic Acid lotion, and White Lotion (page 263). Saturate cloths with the solutions and bind them onto the affected part. Change dressings once a day, or even twice a day at first. When they are removed, all pieces of horny matter, which are now firmly adherent, must be rubbed off with the finger, or a piece of cloth. As secretions diminish, dry powders may prove an advantage, such as Calomel, Sulphate of Iron, Sulphate of Copper, etc. The sulphates must not be used pure, but with animal charcoal in the proportion of 1 part of the sulphate to 8 parts of charcoal. When soft tissues are all horned over, the dressings should be continued for a time, weak solutions being used, to prevent recurrence of the disease. If patient is run down in condition, give the tonic as recommended for "Chronic Indigestion."

ACUTE FOUNDER.—This is an inflammation of the sensitive part of the foot, or what is commonly called the "quick."

Causes.—It may be caused by overwork, in which the feet are pounded and bruised, causing inflammation of the laminae, or leaves; inflammation may leave some other part of the body and go to the feet by a peculiar transference called metastasis, as in congestion of the lungs, pleurisy, colic, inflammation of the bowels following parturition, etc. Drinking cold water when warm, or standing in a draft when heated, will cause it Sometimes a feeding of wheat will cause indigestion and then turn to a bad case of founder. Over eating of wheat or corn is a very common cause. Hard driving on dry roads when shoes are poor, or poor shoeing, may also cause it. Flat feet are predisposed to the disease.

Symptoms.—The acute form is easily recognized by the horse being in great pain, persistently standing in one place, as if riveted there, it being almost impossible to make him move in any direction, especially backward. He stands with front feet out in front throwing weight on heels, hind feet drawn well up under him. He absolutely cannot back, but will hang the body back, throwing most of the weight on the hind legs and stretching the fore legs as far forward as he can. If he tries to lift a foot it causes so much pain in the other one that he ceases trying, and acts as though the foot were fast on the floor. The pulse is quickened, temperature raised, mucous membranes become red and injected, breathing quickened, may sweat profusely, will not lie down, and appetite is more or less lost. The striking symptom is inability to back; if an effort is made to force animal back, the body will incline backward without foot motion. When exhausted from standing, horse will drop, and will lie down most of time afterward, oftentimes absolutely refusing to get up. The inflammation is followed by an effusion of water which separates the leaves or laminae of the "quick" from the horny part, forcing the toe of the foot downward, forming pumiced foot if it is not attended to (see "Pumiced Foot"). Sometimes the inflammation goes on to suppuration. Matter forms and extends around the hoofs, and may cause them to drop off in

very severe cases. If the case is not properly treated, it becomes incurable, forming what might be called chronic, acute founder. The animal presents a pitiable sight. He goes hobbling along with his front feet well out in front of him, keeping the weight on his heels, his hind feet drawn up under him; the sole of the hoof is pushed down, the toes become long and turn up, and there are rough ridges running crosswise of the wall. Acute founder is one of the most painful conditions the horse is subject to.

TREATMENT.—

The treatment should be prompt and vigorous, in which case the majority of the cases recover. It is both local and internal. Locally, wrap the feet in large blankets and keep wet with cold water, applying the water every fifteen to thirty minutes; where it is possible the feet may be tubbed (see OPERATIONS), but it is often impossible to get the animal into the tub. Keep up the fomentation continuously throughout the day; at night can change to poultice if it is possible to get the feet up to apply the poultice; if not, keep up the fomentations well into the night, and continue them until all inflammation is gone and the lameness subsides. After he is somewhat improved, use the clay puddle part of the time. If the horse persists in standing, give him a sling, unless he should lie in it too heavily, in which case it will have to be taken away. If he lies down, keep the fomentations on the same, and roll him over three or four times a day, and keep him lying upon his chest part of the time at least. After being down for two or three days, best try to get him onto his feet for a little while. The local treatment is very important. Remove the shoes as soon as it is possible to do so.

Internally, if from any of the causes except following colic or inflammation of the intestines, give a purgative (6 drachms of Aloes, or ¾ pound of Epsom Salts); repeat the third day, using a smaller dose, if the bowels do not move freely. If following colic, give from a pint to a quart of raw Linseed Oil. Feed a light laxative diet, and grass if in season; if not, a little hay, scalded oats, bran mash, and a handful or two of Linseed meal at a feed. Give water frequently; also give the following:

Fluid Extract of Aconite.....	1 drachm.
Fluid Extract of Belladonna.....	1 ounce.
Fluid Extract of Colchicum Seed....	½ ounce.
Saltpeter.....	2 ounces.
Water to make.....	1 pint.

Shake. *Dose:* 2 ounces, five times between 5 o'clock A. M. and midnight.

After improvement commences, give four times a day, and later three times a day. After two or three days, leave the Fluid Extract of Aconite out of the prescription and put into the prescription in its place, 3 drachms of the Fluid Extract of Digitalis. After improvement is well started, withhold the internal treatment for two or three days, and then give again for a few days. After three or four weeks, if there is still some lameness, blister the pastern from hoof to fetlock, using Spanish Fly blister. (See "To Blister" under "Ring-Bone.") Blister only one at a time.

Where the case has been allowed to run, and this acute form becomes chronic, treat as for "Pumiced Foot." Also use the rubber cushion pad when shoeing.

SORE FEET (CHRONIC FOUNDER.)—This is a form of founder, when it has been of long-standing; has become a part of the organized system, but is not attended with fever, other than slight local heat.

Causes.—Hard work, especially driving on hard roads; bad shoeing, letting the shoe rest too much on the sole; standing on a dry floor, and letting feet become hard, dry, and contracted. Flat feet are predisposed to the affection.

Symptoms.—Are a modification of the acute form. In bad cases there is difficult backing, lameness, pointing of the feet, first one and then the other; horse will go off with a shambling gait, as though the legs were all stiff, keeping the feet well out in front, throwing the weight on the heels, giving chest the appearance of being drawn in. Some make the mistake of thinking the chest is foundered. Shoes will be worn off at the heels, and when pointing them he will extend the feet and rest them on the heel, turning up toes as much as possible. Horses with this disease will choose the soft parts of the road. Hoofs

will feel hot all the time, and there will be uneven growth of hoof, forming rings. Foot becomes much contracted, and hoofs brittle. Is worse on hard ground, and much worse going down hill. Drags the front feet in backing, pulling the straw from the stall in backing out. While the horse will warm up some after starting, a long drive always makes him much worse for a few days afterward. In turning around short, horse steps one front foot over the other in a peculiar and awkward manner.

TREATMENT.—

If long-standing, the treatment is generally not very satisfactory. The first thing is to rest and soften the feet; to do this tub or stand in the clay puddle (see OPERATIONS). Keep the horse in these at least one-half of each day; if a mild case and horse is worked some, put him in an hour or two in the morning, at noon, and again in the evening. Turning into a low pasture is good; avoid hard roads and keep on soft ground as much as possible. Keep off from dry, plank floors. Shoe with a bar shoe, and if flat-footed use a wide web, covering a good part of the sole, but have the upper surface of the web beveled so as not to press on the sole, or use the rubber cushion pad in shoeing. If this treatment fails, blister the pastern as in "Acute Founder."

FLAT FEET AND LOW HEELS.—While this is not a disease it is a conformation which is very subject to disease, and in order to prevent the various diseases to which such feet are subject, careful shoeing is necessary. Do not leave the shoes on too long without setting; not over four weeks, and in some cases they should be set oftener. Use a bar shoe, giving a good degree of frog pressure; have the upper surface of the web beveled so it will not press upon the sole. The rubber pad is good for this class of feet.

SHOEING.—While whole books are written upon this subject, we simply wish to call attention to a few points. In preparing the foot for the shoe, do not cut too much. If a shoe has been removed, cut away what has been prevented from wearing away. Cut from the frog only the loose, ragged pieces. The sides of the bars should not be cut at all; the lower edge can be

taken off a little if it has grown well down; from the sole remove only that which has scaled up and partially separated, and remove enough from the lower border of the wall to bring it even with the sole; be sure this border of the wall is level. Be careful about cutting down the heels too much, they need to be left strong. Never "open up the heels," as the blacksmith calls it, which is simply cutting away parts of the bars and frog-structures that should be left strong. Do not keep a hot shoe against the hoof for any length of time. In summer, shoe road horses, especially in front, with plates—shoes without calks. Shoes should be set every month or six weeks, depending somewhat on the shape of the foot. It is a good plan to let farm horses which do not go on the road much, go barefooted for awhile each spring; and some horses with good feet, and on clay or sandy farms, can go without shoes all summer. The feet should be trimmed occasionally, however, and kept in good shape. In shoeing, the front of the hoof should never be rasped above the nail clinches.

PUMICED FOOT.—This disease is generally the result of acute founder when disease has been allowed to run too long. When inflammation in the feet is allowed to run on several days before treatment is applied, the connection between the sensitive and insensitive laminae, or leaves, is destroyed by the effusion that soaks them apart, letting the toe of the bone tip onto the sole, pushing it down to the ground, and making the lower surface convex, instead of concave as it should be. In some cases the bone will punch quite through.

Symptoms.—Take up the foot, and instead of seeing a nice, cup-shaped sole, it will be found bulged down toward the ground, making it oval the wrong way. If bone is punching through, it will be seen, and will leave no doubt as to what it is. Horse will be lame, with all characteristics of chronic founder.

TREATMENT.—

Nothing can be done to cure the disease. Horse will be worth nothing for road work, but he may be made to work pretty well on the farm, at slow work by blistering him around the tops of the hoofs as in chronic founder. Then turn him out for some time

with a wide-webbed bar shoe, well calked up, and have it well beveled, so he will not have to bear any weight on the sole of the foot; have the whole weight come on the wall, and also have the shoes set regular about once a month. Keep the animal standing in a moist place. In very bad cases the animal should be destroyed.

CORNS.—Corns generally affect the front feet, but may be found on all; are also found most on inside heel of front feet, but may be on outside heel.

Causes.—Horses with weak, flat heels are most subject to them, and they are usually brought on by bad shoeing, the shoe resting too heavy on the heel and bruising the sole between the bar and quarter of the wall. Driving on hard roads has a tendency to bring on corns; steady driving will also cause them; neglect on the part of the owner to have shoes set often enough is a common cause, the foot growing out over the shoe.

Symptoms.—Lameness appears, slight perhaps at first, but growing worse. Horse will show inclination to favor sore quarter, and shoe is not worn as much on that heel; heat will sometimes be noticed in sore quarter if hand is applied to foot. Tapping with a hammer will make horse flinch when sore part is reached, and he will thrust foot forward, resting on the toe and raising heel from the ground. If on both feet, he will point first one, then the other. If corns are small and not very sore, he will go better after getting warmed up, but after a rest will be as bad, or worse, than before. When festered there is great lameness, and he will hardly touch heel to the ground, moving only with great reluctance. When the shoe is removed and the horny sole at the quarter cut away, a purple spot is found just before reaching the sensitive sole, in the angle between the wall and bar, near the heel.

TREATMENT.—

Remove the shoe, pare out the sole of the quarter well, but do not cut quite through to sensitive sole unless there is pus, in which case let it out; the thinning of the sole relieves the pressure; then put foot in a Linseed poultice made up soft with hot water. Leave it on twenty-four hours, then renew it While

poultice is off, examine to see if foot needs any more paring; if pus has formed a deep hole, you will need to cut hoof away to allow matter to escape freely; if not well done, it will work up through the top of the hoof. If cut through to allow escape of pus, before renewing poultice, pour into the opening a little Carbolic Acid solution, and White Lotion (page 263). Repeat dressing once a day until all the soreness is gone, and the horse will stand on the foot as well as ever; then stop poulticing. If a proud-flesh-like growth starts to grow from wound, dust into it burned Alum or Sulphate of Zinc. The hoof pared away will soon grow again. The foot may be tubbed in place of the poultice (see "Founder"). When dry, and horse walks sound on the foot, put a bar on the shoe to protect the weak quarter, giving frog a gentle pressure. Keep the wound clean until it fills in with horn. When shoeing afterward, avoid too heavy bearing on the heels. When quarter has grown out and is strong, the bar shoe may be replaced with an open one. If the foot is much contracted, take the bearing off the quarters by reducing the walls a little, so as to have the appearance of the shoe having been sprung off the heels, but let the shoe be perfectly level, and give quite heavy frog pressure.

A foot that is inclined to have corns should be shod often—every three or four weeks—and the quarters cleaned out each time. The bar-shoe may have to be used continuously. Extra care will have to be taken of feet that have had corns, to keep them soft. Soak them in a tub of either cold or warm water, or pack the hoof with Linseed meal or Oil Cake meal, wet up with warm water. If there is fever in the feet, put on swabs, made of felt or pieces of old blanket or woolen cloth, folded under the foot and tied around the pastern, wetting often with hot or cold water.

THRUSH IN THE FEET.—Thrush is the name given to a disease of the frog. It is an inflammation and ulceration of the frog, attended with a very offensive discharge. In some cases the insensitive frog rots completely off, and the disease extends down into the cleft.

Causes.—The most common cause is the filthy condition of stables in which animal is kept. Mares are more apt to contract the disease in the hind feet when from this cause, while geldings and stallions are most apt to have it in the fore feet. Hard work on rough, stony roads; change from dryness to excessive moisture; muddy streets where mineral substances are plentiful; and some diseases such as contracted heels, scratches, and navicular disease predispose to thrush. An unthrifty condition of the system predisposes to it.

Symptoms.—At first there is simply increased moisture in the cleft of the frog, accompanied by an offensive smell. After a time a considerable discharge takes place—thin, watery, and highly offensive—changing gradually to a thicker, pus-like matter, which rapidly destroys the horn of the frog. As the disease advances, the horse becomes lame and the inflammation may extend to the back part of the heels. In bad cases the pus collects and separates the insensitive frog from the sensitive one underneath.

TREATMENT.—

Keep horse out of wet and dirt, and keep the stable clean. Trim off all the ragged parts of the frog, clean out holes and crevices and cut away any horny frog that has separated; then poultice a day or two with Linseed meal, using a Carbolic Acid solution for making the poultice, and add a handful of charcoal. Then clean the cleft of frog and grooves on edges, and fill them with dry Calomel, using a case knife or some instrument to see that all places are well filled. If discharge is profuse, repeat daily, otherwise let a day intervene between application. Continue until all discharge ceases. If horny frog is removed, protect until a new one is formed by fastening cloth under the bottom of the foot. In bad cases give internally a laxative and also a teaspoonful of Saltpeter three times a day.

NAILS IN THE FEET; PUNCTURES.—

Causes.—May come from driving a nail against the quick when shoeing; or a nail may be picked up in the street. It is

often done by stepping on a board containing a nail, which often pulls out as horse steps off, or the nail may be broken and left inside.

Symptoms.— Sudden lameness denotes that something is wrong. Examine the sole of the foot, and if necessary pull off the shoe. If a shoe nail has punctured the quick, it will be moist and black. If a nail is found anywhere in the foot, pull out carefully so as not to break it off. Should it break off, pare away the hoof around it, get hold with nippers and pull it out. If the nail was in a board and pulled out when the foot was lifted, by carefully examining the hole may be found. The lameness will accord with amount of injury; if the tendon that plays over the navicular joint is pierced, it will be great, long-continued and sometimes permanent. In many cases there is high fever, great pain, restlessness, blowing, redness of eyes, and horse will not lie down. Will paw or continuously raise the feet. Sometimes loss of appetite; flanks tucked up, and great pain is evidenced, especially if wound is in hind foot, and more so still if navicular joint is punctured. In latter case there will be a discharge of joint oil, which clots like blood after running out. When dressing, amber-colored matter is found on poultice. In bad cases, leg swells even to body. There is great heat in foot and leg, and pain is shown if foot is tapped. There will be a swelling, hard and hot, in hollow of pastern and around heels, with much tenderness to touch. Cases in which the joint is not wounded may become serious if wound is not properly treated.

TREATMENT.—

When shoe is taken off and puncture is found, pare away the horn for some distance around the opening, and at the point where the nail entered, open to the quick; this will remove pressure when it swells. Then turn in a small quantity of strong Carbolic solution — 1 of Acid to 20 of water. Now put the foot in a poultice of Linseed meal; change once a day and examine the wound each time to see that any matter that forms can escape. Or, instead of the poultice, the foot may be tubbed, or they may be alternated. (See "Founder" for tubbing). In mild cases, wounds will get well soon, lameness will

disappear, and horse can be shod and used. If a bad case and much matter forms, it will extend under the hoof and spread. In order to prevent this, it is best to remove that part of hoof which has matter under it. The same rule applies to frog; sometimes matter works under the frog, and it has to be removed, but a new one forms quickly.

A hot poultice is perhaps best, except when the joint is punctured, then put on a cold one instead. At each dressing put on Carbolic lotion, and poultice right over it. Should proud flesh come up, apply burned Alum or Sulphate of Zinc once a day; if it comes up suddenly, and large like one's thumb, cut it off with perfect safety, then when bleeding stops, apply the Alum or Zinc. When there is no more matter, and lameness is nearly gone, leave off poultice and dress once a day with the Carbolic lotion, also White Lotion (page 263). If joint is opened, the accident becomes very serious; continue the poultice, and bathe the foot with White Lotion twice daily. Tub with cold water part of the time in place of the poultice. Do not try to stop the discharge suddenly. Put a sling under the animal if he will not lie down. Feed lightly on laxative diet, and give the following internally:

Fluid Extract Aconite.....	2 drachms
Fluid Extract Belladonna.....	2 ounces.
Fluid Extract Colchicum Seed.....	1 ounce.
Saltpeter.....	3 ounces.
Water to make.....	1 quart.

Shake. *Dose:* 2 ounces, three times a day. After giving for five days, discontinue for two or three days and give again.

Neglected nail pricks are apt to be followed with lock-jaw, for this reason nail pricks should always be opened freely to admit the air (see "Lock-jaw"). The outer opening of the puncture should never be allowed to close quickly, but keep freely open and use strong Carbolic Acid lotion freely. When a valuable horse receives a nail prick, it is a good plan to have a veterinarian give an injection of the tetanus anti-toxin as a preventive against lock-jaw.

QUARTER CRACKS AND SAND CRACKS.—These are cracks in the hoof, usually extending lengthwise of the fibre, though sometimes they may break across the fibre for a distance of an inch or more. They sometimes extend through the hoof into the laminae, or quick, and cause lameness. Quarter cracks occur at the quarters, usually on the inside quarter, on account of that one being thinner and weaker than the outer one. Sand cracks may come on the hoof anywhere forward of the quarters, and are so called because more common in sandy sections.

Causes.—A brittle condition of the hoof, from want of sufficient moisture. Sometimes the hoofs become cracked from the heating, drying influence of sandy roads, stony pavements in cities, and long continued want of moisture, A transfer from pasture to a dry stable floor may produce cracks. Small feet with hard hoofs, and feet that are excessively large, are more susceptible to sand cracks than those of better proportions. Heavy shoes, large nails, and nails set too far back toward the heels, with such diseases as canker and quittor, occasionally cause sand cracks, while fast work on hard roads, jumping, injuries to the coronet, and calk wounds of the feet, when they injure the coronet, are causes of quarter crack.

Symptoms.—A crack or split in the hoof, which may be only at top or bottom, and very short, or in the center between top and bottom; or it may extend from top to bottom. It may extend in but a little way, or go in to the quick so that soft parts are pinched between edges of crack, causing great lameness. The lameness may come on gradually or at once, depending whether crack extends at once to quick or deepens by degrees. The quarter crack is generally more serious than the sand crack.

TREATMENT.—

Remove the shoe and reduce the wall of that quarter, to take off bearing, and apply a bar-shoe giving frog pressure. If broken through into the quick, take a sharp, shoeing knife and pare down the edges of the crack the whole length, enough to relieve the pinching, but not through to the quick, and for a half inch on each side the crack, to make it pliable. Then take a sharp knife, or a file, and cut across the crack at the top, nearly

to the quick. Make cut at least an inch long; this is to prevent the crack from continuing, and the new hoof will grow down sound and natural. If the crack does not extend to the quick, it is not necessary to pare away edges. This you may know by the horse not being lame. It is a good plan to cut across the crack at the top, and to take off bearing at the bottom, but not to cut as deep as in severe cases. Then have a plate of iron or copper, half inch wide, and an inch and one-half long, screwed on across the crack; have screws about one-fourth of an inch long, and screw them into the hoof, while the assistant draws the edges of the crack together with a pair of pincers; the horse at the time standing on the other foot to take the weight off the one being treated. Or, in place of the plate, cut a little shoulder in the wall, three-quarters of an inch back from the crack on each side; bend a piece of stiff wire much the shape of a hog ring; fit the points of the wire against the shoulders and press together with pincers. If flesh grows up between the edges of the crack, burn it down with powdered blue vitrol, or burned alum, applied once a day. When it is dry and the soft parts healed by the vitriol, dress it with pine tar once a day. To hasten the growth of a new hoof, keep the feet moist by poulticing, or tubbing, and this should always be done if crack goes to the quick; or a Spanish Fly blister applied just above the coronet will hasten the growth of new horn (see "To Blister"). If a quarter crack is the result of an injured coronet, which, in healing, left a break in its substance, it will be very hard to overcome, as the wall will always be weak at that point. The continual use of a bar-shoe may support the weight without a crack forming. Great care should be taken in dressing an injured coronet to see that the torn edges contact each other perfectly.

CALKS.—Horses wearing shoes with sharp calks are liable to wounds of the coronary region, either from tramping on themselves, or on each other. These are common in draft horses, especially on rough roads and slippery streets, or where an animal gets into deep mud or snow. The fore feet are more liable than the hind ones, and seat of injury is commonly in the quarters. In the hind feet the wound often results from the animal resting with the heel of one foot set directly over the front of the other.

TREATMENT.—

As a preventive measure, boots could be used to protect the coronet of the hind foot, if horse stands with one foot over on the other.

If the wound is in the skin and of any length over an inch, take a stitch or more, putting them half an inch apart, but not in such a way as to prevent drainage. If an artery is cut so as to bleed a stream, pick up and ligate, or put on a dry sponge, and bandage it tightly with coarse cotton, and leave on twelve hours; then take off and dress with Carbolic lotion and bandage again, but only tight enough to keep parts in place; see "Treatment of Wounds." Remove bandage twice a day, and syringe out with warm water, and afterwards with the Carbolic lotion. Later apply White Lotion, as given in "Wounds," dressing with this twice a day, and washing as often as is needed to keep clear of pus. If wound is inclined to gape open, continue the bandage a few days.

If the calk is on the coronet, running down under the hoof, it will fester; pus will accumulate and cause great lameness; part will swell, and be red, hot, and tender to touch; in some cases horse is so lame as to prevent putting the foot on the ground at all. One of the principal points in treating this wound is to keep the torn ends of the coronet together, so as to have it heal without any break in it. Pare away all ragged edges of the skin and enough of the hoof, following the sore down, to allow escape of the pus; remove any hair or other foreign matter that may have gotten into it; then apply a poultice, after syringing with Carbolic lotion. Change poultice twice a day, using lotion each time, and examine wound carefully to see that there is no pocket containing pus. Cut away no more of the hoof than is necessary to keep the pus out of the wound, but enough for that. Continue the poultice, or tub part of the time, till hole fills up and lameness is nearly or quite gone; then quit the poultice, and use White Lotion (page 263). Lay horse up until wound is well enough not to be injured by sand getting into it. If proud flesh springs up, burn it down with burnt Alum, or Sulphate of Zinc. When hoof is growing down, apply a mild blister to the coronet, and trim new growth to keep it smooth. The flesh that fills up

the hole must be kept down even with the deep edge of the old hoof, otherwise the edges press against the flesh and prevent it from healing. If the coronet is badly torn, unless carefully brought together, and the wound properly dressed, there will always be a weak place in the hoof below, which will bother about cracking.

OVER-REACHING.—An over-reach is where the shoe of the hind foot strikes and injures the heel or quarter of the fore foot.

Causes.—Is generally caused by fast driving, and is most common in trotting and running horses. In trotters it most commonly happens when the animals break from a trot to a run.

Symptoms.—The coronet at the heel, or quarter, is bruised or cut, the injury involving the horn as well. When hind foot strikes well back on heel of the fore foot, catching the shoe—an accident known as "grabbing"—the shoe may be torn from the fore foot, or horse fall on his knees.

TREATMENT.—

The treatment is much the same as for calking, depending somewhat upon the nature of the wound. Sometimes the wound can be sewed, sometimes not. Cold fomentations, Carbolic lotion and White Lotion (page 263) are to be used. Keep wound clean by syringing. If part becomes inflamed and fomentations do not overcome it, poultice part of the time.

When horse is known to be subject to over-reaching, he should never be driven fast without quarter boots, which are made for protecting the heels and quarters. If there is a disposition to "grab," treat as for "Forging."

FORGING.—Forging is the habit of clacking the fore and hind shoes together when trotting. The only real harm is the wearing off of the toe of the hind foot, but it is very annoying to the driver, and fatiguing to the horse. As the fore foot is being raised off the ground, with the heel already raised, and the foot in the act of rolling on the toe, the toe of the hind foot comes flying in under the heel of the fore, and the two shoes come

together, the toe of the hind against the underside of the web of the fore, making the clacking noise. It often wears off the toe of the hind foot badly. With some horses the hind shoe is apt to grab the front one and pull it off, or cause the horse to fall.

TREATMENT.—

Increase the action and activity of the fore leg, to get the foot out of the way of the hind foot. To do this, keep the toe of the front foot as short as possible, raise the heels a little by using longer heel, than toe, calks; and with most forgers, shoe rather heavy in front. Slow up the hind feet by shoeing light, by letting the toe grow long, and by raising the toe just a little by using longer toe calks. With some horses it is impossible to overcome the difficulty, and they will need to be kept at slow work.

If there is a tendency to grab the front shoe, keep its heels as short as possible so that the hind shoe cannot catch them.

BRUISES OF THE SOLE OF THE FOOT; STONE BRUISES.—

Causes.—Stepping on stones or other hard substances; or from wide-webbed shoe pressing on the sole.

Symptoms.—The horse, in traveling, steps either long or short to keep on heel or toe of the affected foot; by tapping the sole of the foot with a hammer, he will flinch when the bruised spot is struck. If not attended to, symptoms will be more severe; horse will hardly be able to put foot to the ground, and it will be hot and swollen around the top.

TREATMENT.—

Remove the shoe and find affected spot by tapping on the sole with a hammer, and if there is no signs of festering, put on a poultice of bran and Linseed meal in equal parts, or tub the foot. Change poultice twice a day until the soreness is all out. Should there be signs of festering, pare a hole in through the sole to allow escape of matter; flush out with Carbolic lotion, then poultice as above directed until animal is better. Use Carbolic lotion and White Lotion (page 263) in treating wound each time,

before applying poultice. If proud flesh starts, apply burned Alum or Sulphate of Zinc. Give laxative diet and a teaspoonful or Saltpeter three times a day in his feed.

FRACTURES OF THE BONES OF THE FOOT.—*Causes.*—By striking the foot with great force against any substance, especially if the foot receives the blow on the quarter; by being run over by a loaded wagon; or by being stepped on by a heavy horse.

Symptoms.—Extreme lameness comes on suddenly, soon after the accident, and increases with time. The foot swells around the coronet, and horse will not put any weight on it at all.

TREATMENT.—

All that can be done is to keep down the inflammation as much as possible by tubbing and poulticing. Give the horse a sling so he will not try to lie down. Long rest will be necessary, if recovery takes place at all.

FALSE QUARTER.—This is a term applied when there is a more or less separation of the quarter from the toe by a bad quarter crack, or an irregular growing of the horn of the quarter.

Causes.—An injury to the coronet, from which the hoof grows. Very apt to follow severe calking unless injury is properly treated. This causes an alteration of the horn of the hoof below, corresponding to the extent of the injury.

Symptoms.—There is a crack or depression in the hoof, varying in width and depth with the extent of the injury. Animal may not be lame, but a misstep is apt to cause the thin hoof to crack and produce lameness.

TREATMENT.—

Apply a bar-shoe, giving frog pressure and removing pressure from the affected quarter; also strengthen, as recommended in treatment for "Quarter Crack."

COFFIN JOINT LAMENESS—NAVICULAR DISEASE.—One of the back tendons passes down the back of the leg, enters the hoof in front of the frog, beneath the navicular

bone, that lies directly above the frog, and attaches itself to a rough hollow on the sole of the coffin bone. Disease in that part of the tendon, which contacts the navicular bone, is navicular disease. The tendon becomes inflamed, inflammation extends to the navicular bone, which becomes rough and porous, the tendon and bone growing together in bad cases. In some cases disease begins with the bone. The disease is much oftener seen in the city than in the country.

Causes.—Severe sprains of the tendon in its lower portion; any severe bruise on the frog or heels; the prick of a nail entering the foot far enough to wound the tendon, or joint; and severe contraction of the foot might cause it by pressure on the navicular bone, interrupting nutrition, and thereby setting up disease. Hard driving on pavements, or hard dry roads, or by allowing feet to become hard and dry, also act as causes.

Symptoms.—The lameness comes on gradually, and at first may be very slight when first starting, but later it becomes continuous, and is always worse when he first starts. It will improve as he gets warmed up, though not so as to go sound, for the tendon being inflamed, it is impossible for the lameness to disappear altogether. Horse will wear shoes out most at the toes, will point feet when standing, alternating if both are affected, and rest them on the toes. As disease progresses the gait becomes short, horse is liable to stumble, going too much on his toes, forming lameness known as "groggy lameness." The horse keeps his feet well back under him, which distinguishes it from founder, in which the feet are kept out in front, and weight thrown onto the heels. The pastern will be straightened up nearer the perpendicular than is natural. The feet will become contracted, especially at the heels; the heels getting high, the frog small and dry.

TREATMENT.—

As a general thing treatment is very unsatisfactory, and with cases that have existed for any length of time is alleviative only. As soon as the first symptoms of lameness are noticed—slight lameness, with inclination to stumble, going out a little lame and improving on warming up, with exercise—put on a high-heeled

shoe, give the horse long rest, and tub the feet, or allow the horse to stand in a clay puddle half of each day; the remainder of the day keep the horse in a low pasture, or in a box stall with a damp, dirt floor. Continue the treatment for a month or two, and if there is still some lameness, blister from hoof to fetlock with Spanish Fly blister (see "To Blister" under "Ring-Bone"); follow this with another month or two of the previous treatment. If taken at the very outset, this line of treatment may benefit materially, if it does not cure. If the disease is well seated all that can be done is to alleviate as much as possible. To do this, shoe with high-heel calks, or use a rolling-motion shoe—a shoe with the web extra thick at the heels, but commences a a little back of the center and tapers down until very thin at the toe. Keep the feet moist and soft by standing the horse in a clay puddle a portion of the time. Turn into low pastures when possible. Keep off of hard roads as much as possible and give slow work. With severe, confirmed cases the horse may be nerved; the operation consists in cutting the nerves which lead to the foot, thus destroying sensation. The operation would need be performed by a veterinarian. It does not cure the disease, simply stops the lameness. The horse may do good work for a number of years after the operation, or he may go down in a short time; he will not save the feet as much as before operation, and the extra strain may break the weakened tendon where it passes over the bone. The foot of the horse that has been nerved should be carefully watched to see that it is not injured in any way.

HOW TO BREAK OF VICES

GNAWING THE MANGER AND CLOTHING.—This habit, especially gnawing the manger, indicates a derangement of the digestive organs, a want of salt, or is simply the product of idleness. Blanket tearing sometimes results from horse being too warm, more particularly when horse is fat; the skin gets hot and itches, and he would be much more comfortable without the blanket. In some cases he might need medical treatment.

TREATMENT.—

If animal is unthrifty, give treatment for "Chronic Indigestion" and for "Worms." If the result of idleness, give plenty of work and feed accordingly. If the habit is persisted in, smear manger with asafetida, or cover edge with sheet iron. If a blanket is a real necessity, the horse can be prevented from tearing it, by tying a stick from the check piece of the halter to the surcingle. If the skin shows disease of any kind, treat accordingly.

KICKING WHILE EATING GRAIN.—This is an outgrowth of idleness in connection with nervous disposition. The horse, while eating his grain, will kick the side of his stall four or five times a minute. This he may do with one foot, or he may alternate, using first one and then the other.

TREATMENT.—

Tie a piece of chain, a foot or two in length, to the pastern of the foot used; this will sometimes prove effectual. Another plan is to run a small rope from a collar under a surcingle to the foot. Or, place the feed box rather high, so that his head will be kept well up.

WASTING GRAIN.—This is a habit of taking up grain into the mouth and then, by swinging the head around, lose a large amount of it. In some cases is due to the animal holding his head sidewise from diseased teeth.

TREATMENT.—

If the teeth are at fault give treatment as is recommended in such cases. If not from this, spread the grain out in a thin layer over the bottom of a large manger, so that his time will be fully employed picking it up; or, if fed in a small feed box, place a few stones the size of a man's fist in the box; the grain will sift in among these and he can get but a small mouthful at a time

PULLING BACK AND BREAKING HALTER.—This commonly originates from fright, when by suddenly jumping back the halter is broken. The animal knowing that what has been once done can be done again, repeats, and it finally becomes a vice.

TREATMENT.—

Have a very strong halter, and tie animal high on the manger; this will give the horse less power to pull than when tied low. Another way is to take a long rope, pass one end around the body just in front of the hips and tie in a slip-knot; pass the other end underneath a surcingle, between the front legs, through the ring in the halter, and tie to the manger. He will make only a very few attempts to break loose.

CRIBBING AND WIND-SUCKING.—(See page 99.)

BALKING.—The best way to break a horse of balking is never to be in a hurry, but, rather let him stand to his heart's content; avoid hitching him to any load he cannot pull easily; coax and pat him; feed him apples, salt and sugar, etc., out of the hand; if checked, uncheck him; pull his ears; hold up one front foot for a time; try to divert his attention. If possible, let the same person drive him. If these fail, and he is with a trusty horse, back the trusty one as far as possible, and lead the balky one up; take a good sized rope, put it around the flank of the balky horse, and tie in a slip-knot, but so it cannot slip only so tight, but tight enough to pinch him in good shape; tie the other end to the hame of the other horse, and start him gently. This should not be resorted to if there is a heavy load behind the horses, or if he has any reasonable excuse for balking. Never

get the horse that has a tendency to balk into a tight place. No two balky horses are exactly alike, so the disposition must be studied, and the animal treated accordingly. In all cases, however, use kindness. The habit is most often formed by overloading young horses, or by asking them to pull when very tired. A disposition which tends toward balking may be inherited, and animals inheriting this disposition should be carefully handled when young.

POISONS AND THEIR ANTIDOTES

Horses are frequently poisoned in various ways: by eating noxious plants; by getting poisons left in the stable; and sometimes by overdoses of strong medicines. Malicious persons, from motives of revenge, may be the cause of horses being poisoned. Therefore it is well to know something of the nature of common poisons, and also the simpler antidotes. It might be a good investment to commit to memory these few general directions: When an animal is poisoned by an alkali, give him an acid, such as vinegar, etc. For poisoning by an acid, give an alkali, such as Bicarbonate of Soda (Baking Soda). These articles are nearly always at hand.

POISONING BY DRUGS AND MINERALS.—

Aconite is frequently given in an overdose, and causes profuse perspiration; spasm of the glottis, seen in the continual swallowing when there is nothing to swallow; congestion of the lungs, with difficult breathing; inflammation of the stomach and bowels; and quick pulse, gradually becoming imperceptible. *Antidote*—Give stimulants, Alcohol or Whiskey; if these are not at hand give strong Coffee in pint doses every fifteen minutes until relieved. One-half to 1 grain of Atropine dissolved in a little water and given by the mouth helps counteract the action on the heart.

Arsenic is at times the cause of poisoning. It is a corrosive irritant poison, causing diarrhea, mucus discharge from the eyes and nose, a quick, wiry pulse, and injected mucous membranes. *Antidote*—The best chemical antidote is Sesquioxide of Iron (iron rust). To prepare, dissolve Copperas and Bicarbonate of Soda separately in water and then mix the two solutions, when iron rust will fall to the bottom. Wash it with warm water, put in a bottle, and give 3 or 4 tablespoonfuls every ten to fifteen minutes. Being insoluble, it will have to be washed down the horse's throat with plenty of hot water from the bottle. When this remedy is absent, give eggs, milk, powdered charcoal, or blue clay. Also give an ounce of Laudanum to help counteract irritation of digestive tract.

Aloes in large doses is poisonous. It produces diarrhea and superpurgation; dryness of the mouth; yawning and straining; quick, hard pulse, gradually becoming imperceptible; injected mucous membranes, and sometimes irritation of the kidneys. *Antidote*—Give powdered Ipecacuanha in ½-drachm doses every hour; starch gruel, internally, and cold injections of the same into the rectum, with 1 ounce of Laudanum in each injection, repeating gruel and injection every hour; Opium in 1-drachm doses, or 1-ounce doses of Laudanum every four to six hours; chalk, port wine, or any drugs used to counteract diarrhea, and hot fomentations to the belly. Give alcohol to stimulate the heart.

Ammonia, Carbonate, is sometimes given in too large doses, or not sufficiently diluted, when mouth, throat, and stomach become blistered and burned, and salivation follows. *Antidote*—Give Olive Oil in doses of two to three tablespoonfuls, five or six times a day; also milk and eggs.

Belladonna is a favorite remedy in some cases, but if given in too large doses is a poison. There is dilatation of the pupils of the eyes; stupor, swelling of the head, and delirium. On post-mortem the blood will be found fluid, and decomposition sets in early. *Antidote*—Give Alcohol, Whiskey, or strong Coffee, as with Aconite poisoning; apply Mustard to the chest and cold to

the head; give milk and Linseed Oil—a pint of each, mixed—and gentle exercise, and also a tablespoonful of Saltpeter.

Calomel is a corrosive, irritant poison, and causes a discharge of black, offensive manure, diarrhea, with great depression. *Antidote*—Give Opium in 1-drachm doses, or Laudanum, 1-ounce doses three times a day; also use Flaxseed tea.

Cantharides (Spanish Fly) is a narcotic, irritant poison, causing inflammation of the urino-genital organs; imperceptible pulse, and injected mucous membranes. *Antidotes*—Give 1 pint Linseed Oil, which follow after an hour with large quantities of Flaxseed tea or mucilage; apply hot cloths to the loins; give starch gruel injections, with an ounce of Laudanum in each injection; or Opium in 1-drachm doses, or Laudanum in 1-ounce doses, three or four times a day. Give drachm doses Fluid Extract Belladonna three or four times a day.

Chloroform is a narcotic poison. It causes a slow pulse; slow, heavy breathing; insensibility to pain; muscular twitchings; dilatation of the pupils; foaming at the mouth, and stupor. *Antidote.*—Throw cold water over the animal; raise and lower the fore legs continuously; pound the chest to induce respiration; use bellows at the nostrils; if possible, give Alcohol or Whisky, if not, have him inhale fumes of Ammonia.

Chloral Hydrate is similar, both in effects and antidotes, to Chloroform.

Croton Oil is an acrid, irritant poison. It may be either swallowed or absorbed from the skin, and causes inflammation of the stomach and bowels, drastic purgation, and great prostration. The treatment is that for "Diarrhea, or Superpurgation."

Copper Sulphate is a corrosive irritant poison, bringing on inflammation of the stomach and bowels, and diarrhea; ulceration, perforation, and thickening of the mucous membranes; quick, hard, almost imperceptible pulse; and when near smelting works, emaciation, paralysis, and bony disease of the joints. These

latter symptoms characterize the chronic, slow poisoning resulting from grazing in the vicinity of such works, and inhaling the condensed fumes, or eating the poison-tainted grass; the remedy is: To remove from that vicinity. In cases of acute poisoning give a pint of Linseed Oil, eggs, soap in small quantities, and milk, or Flaxseed tea.

Corrosive Sublimate is frequently taken in the form of rat poison, and is an irritative, corrosive poison, causing inflammation of the stomach and bowels, fetid diarrhea, salivation, fetid breath, quick, weak pulse, and yellow appearance of the mucous membranes. *Antidote*—Give milk and eggs in large quantities, with occasional doses of opium in 1-drachm doses.

Ergot of Rye is a fungus that grows on rye and other kinds of grain, and is developed on low, undrained soils by long continued damp weather. In large amounts it causes narcotism, colic, diarrhea, and perverted nervous action; impairs the appetite; induces weakness and wasting, and serous, sometimes bloody, discharges from the mucous surfaces; and in a chronic case, sloughing of the ears, tail, and even of the limbs. *Antidote*—Give a pint of Linseed Oil, and follow it with large quantities of Flaxseed tea, and give ½ ounce of Ether in ½ pint of water three to four times a day.

Iron Sulphate is a corrosive, irritant poison, causing the same symptoms as the Sulphate of Copper. *Antidote*—Tannic Acid, 2 drachms in ½ pint of water, or Bicarbonate of Soda, 1 ounce. After a few minutes give large quantities of Flaxseed tea. Repeat the whole treatment every few hours.

Nux Vomica is an irritant poison, and causes tetanic spasms and general convulsions; convulsions of the diaphragm, causing labored breathing, and sometimes asphyxia. *Antidote*—Give Chloral Hydrate in doses of ½ ounce every two hours, with an occasional dose of opium—1 drachm; also 1 ounce of laudanum, repeated in an hour, or Fluid Extract of Belladonna 1 drachm. Avoid exciting animal in any way.

Opium is a narcotic poison, producing partial or total paralysis, stupor, labored breathing, slow pulse, and contracted pupils. After death the blood is fluid, and decomposition sets in early. *Antidote*—Shower with cold water, give Tannic Acid 2 drachms, and an occasional dose of Sweet Spirits of Niter, ½ ounce at a time; also 1-ounce doses of Alcohol, and a dose or two of Fluid Extract of Belladonna, 1 drachm at a time, and compel horse to take exercise.

Lead, in all its forms, is a corrosive, irritant poison, which, in acute cases, produces violent constipation, delirium, colic pains, tremor of the muscles, and inflammation of the stomach and bowels. In chronic cases, where the symptoms develop slowly, there will be noticed what is called "Plumbism," bony deposits, solidifying of the joints, paralysis, staring coat, a blue line around the gums, emaciation, quick and wiry pulse; black feces that are glazed and fetid, the abdomen tucked up, and constant moaning. *Antidote*—Give Epsom Salts, 4 to 8 ounces; after an hour give Iodide of Potash, 2 to 3 drachms; accompany any of these with occasional doses of Opium, 1 drachm. Put Mustard paste on the belly, and use large quantities of Flaxseed tea.

Nitrate of Potash—Saltpeter, in large doses, is an irritant poison, causing inflammation of the stomach, bowels and kidneys, injected membranes, inflammation of the gullet, colic, and the like, and it has a powerful sedative action on the heart. *Antidote*—Give Linseed Oil and follow it with Flaxseed tea and Whiskey; also give vinegar; put Mustard paste on the belly and over the gullet.

Strychnine is to be treated the same as Nux Vomica.

Turpentine is an irritant poison, causing inflammation of the intestinal tract, strangury of the kidneys, quick and hard pulse, diarrhea, and a violet odor and a high color to the urine. *Antidote*—Give a pint dose of Oil, with Starch gruel and Laudanum, both internally and as an injection; if these are not at hand, give milk; put hot cloths on the loins.

White Hellebore is an irritant poison, causing intermittent pulse, inflammation of the stomach and bowels, diarrhea, spasms

of the superficial muscles, salivation and great prostration. It may be absorbed from the skin, as well as taken internally, doing damage in either case. *Antidote*—Give eggs and milk in large quantities, and small doses of Olive Oil and Sweet Spirits of Niter.

POISONING WHILE GRAZING.—

While animals, as a general thing, refuse to eat plants which are poisonous, yet, under certain conditions, such as poor, short, or dry pasture, or where the poisonous plant is mixed with hay, they may eat sufficient quantities to produce poisoning.

Prevention is the principal treatment. Do not allow animals to pasture where the poisonous plants grow, and especially so if the pasture is short and dry, and the plant green. The medicinal treatment is to counteract symptoms; if weak heart, with prostration, give Alcohol or other stimulants, with a little Strychnine or Nux Vomica; if convulsions, give quieting drugs, as Chloral Hydrate, Belladonna, Opium. Oil or Linseed gruel is always good, as it counteracts the irritation to the digestive tract, if present. Permanganate of Potash in ½ drachm doses in a quart of water, for the horse, is of great value. The following are plants that have the reputation of being more or less poisonous:

The Larkspurs—Some species being more poisonous than others.

The Black Cherry—The leaves or fruit, when taken in sufficient quantities, have been known to poison.

Loco Weed poisoning is treated in connection with the nervous disorder (see "Loco Disease").

Water Hemlock, a plant growing in damp, marshy places, one of the most poisonous plants growing in the United States; the roots seem to possess the greatest amount of the poisonous principle, and animals have been poisoned by eating them.

Poison Hemlock, another species of hemlock, also called spotted parsley and by a number of other names, is also poisonous. The poison is found in the seeds and leaves.

Laurels.—There are a number of species which possess poisonous properties, and deaths have been reported where animals have eaten the leaves and smaller stems.

Horsetail is also claimed to be poisonous to horses when fed in their hay for any length of time. The weed should be removed from the hay before it is fed.

Millet has been proved by experience to be a slow poison when fed as a fodder alone. The term "Millet Disease" has been adopted as a name in some parts. Principal symptoms are those of increased action of the kidneys, with lameness and swelling of the joints. There is infusion of blood into the joints, the bone texture is destroyed, rendering it soft and less tenacious, so that ligaments and muscles are easily torn loose. *Antidote*—Discontinue the feeding of millet, give other foods, and use tonics as for "Chronic Indigestion."

VEGETABLE POISONING BY CONTACT.—

Poisoning by the skin, the same as with people, is not an uncommon occurrence, from the nose or lips coming in contact with poisonous plants in grazing, such as poison oak, poison ivy, poison sumac, St. John's wort, etc. The symptoms of such poisoning are about those manifested by man from the same cause.

Antidotes — Are both constitutional and local. Internally give a laxative of Oil; and a teaspoonful of Saltpeter three times a day. Locally wash the affected parts with the following:

Sugar of Lead..... 1½ ounces.
Alcohol..... 1 pint.
Water..... 1 pint.
Shake. Apply as a wash, two or three times a day.

POISONING BY STINGS OR SNAKE BITE.—

In many sections the farmer is liable to have his team severely stung, by hornets, bumble-bees, or the like; while in the Southwest the torture inflicted on stock by swarms of gnats and poisonous flies is quite as serious. Horses are also bitten sometimes by venomous snakes.

For stings, any of the following remedies may be used: A strong solution of salt and water. Onion juice is another good remedy. In severe cases bathe with Ammonia water (strong Ammonia, two or three ounces to a pint of water, or the weak Ammonia with an equal part of water.) Sponging the parts with lime water, or with a weak solution of soda and water, and following this by smearing over with Linseed oil is very good. To protect against gad-flies, wash the flanks and parts most likely to be attacked, with a strong infusion of the green bark of the common elder. As a protection against buffalo gnats, that are very troublesome in some parts, smear the parts they most attack with a mixture of lard, 2 parts; tar, 1 part; or equal parts of petroleum, lard oil, or bacon drippings, and tar.

For the bite of a rattlesnake, or other venomous serpent, give as quickly as possible:

Hartshorn.....	1 teaspoonful.
Whiskey.....½ pint or,	3 ounces Alcohol.
Warm water.....	1 pint.

Mix, and give. Repeat the mixture in half an hour, and again in one hour after, as symptoms indicate.

Cauterize the wound at once with a hot iron at white heat, and keep the adjoining parts wet with Ammonia for some hours with a sponge.

Stings of centipedes, scorpions, and tarantulas, should be treated as for snake bite, except it is not customary to cauterize the wound.

MISCELLANEOUS INFORMATION

A CHILL.—

Cause.—From taking a cold drink of water after working hard; or from being allowed to stand in the cold afterward; or it may develop as the early symptom of some internal disorder.

Symptoms.—Horse will refuse to eat; shivers; looks dull; back arched; respiration heavy; the pulse is accelerated, and the temperature rises. This is not a disease in and of itself, but is

rather the symptoms of one, and the animal should be carefully watched afterwards to see what disease is to follow, and treat accordingly; sometimes it is nothing but a mild fever, but many times something more serious may ensue.

TREATMENT.—

As soon as noticed put the horse in a warm stall and put on an extra blanket or two to get him warmed up. If his legs are cold, rub them to arouse the circulation, and give as a drench:

Sweet Spirits of Niter	1 ounce.
Alcohol	1 "
Fluid Extract Aconite	5 to 10 drops.
Fluid Extract of Belladonna	1 drachm.
Ginger	2 tablespoonfuls.

Mix, and give in a pint of lukewarm water, repeating the Alcohol and Ginger in an hour, and the entire dose an hour later if the chill is not over.

If the above is not at hand give any stimulant, as Alcohol or Ammonia. A chill should always be overcome as soon as possible, as the longer it runs the more serious the fever that follows. After the chill is over, give a fever mixture, as the one recommended in early stages of "Inflammation of the Lungs," and watch for complications.

HOW TO EXAMINE FOR SOUNDNESS.—The great thing to remember in examining a horse for soundness is to be systematic; and while we can commence at any point, it is perhaps best to commence at the left side of the head. In examining any part, think of that part only, and of all the diseases which might affect it. If possible, see the horse while standing in his stall, undisturbed, to see if he has any stable vices; watch him carefully as he is backed from the stall, because some slight lamenesses only show at this time. After taking the horse from the stall, have him jogged at the halter, past you, away from you, and toward you; have him turned both ways. Having satisfied yourself that he is free from lameness, stand him squarely on all four feet and commence your systematic examination. Commence by examining nostrils and mouth, looking at his teeth in order to

tell his age; then look close into the eyes to see that there is nothing wrong; pass the hand up around the ears and the top of his head, to see that they are all right; then examine the neck, by starting at the top, running the hand over it to the withers, then over the shoulder, down the outside and inside of the fore leg, and watch carefully for splints, side-bones, ring-bones, and like affections; then raise the foot and see if it is well formed, with good, strong heels; look back along the belly for warts and running sores as the result of castration; then pass the hand down the back of the hips and see that the hip bones are both the same size; then follow the hind leg over the hock and hind fetlock and look for spavins, wind-galls, curbs, splints, side-bones and ring-bones, and also at the stifles, and see that they are all right; examine the foot as you did in front, then go over the other side in same detail. Go slowly, dwelling on each part a sufficient time to think of all its diseases. After this, stand back and see how he stands on his legs, if hips are symmetrical, and also how he holds his head and neck; then pass to the front and notice if he stands with his front feet well under him, for this is a good sign; at the same time see if he is inclined to be weak in knees or fetlocks. Beware of calf-kneed horses, for they are always stumblers; see that horse stands neither too straight nor too crooked on his hind legs; see that he has a well-formed breast, and that he does not toe in nor toe out too much; then make an effort as though you would strike him with a whip over the side; if he grunts as he jumps, examine to see that he is not a roarer; to do this have him run for one-eighth of a mile, stop him suddenly and place ear quickly to the throat; there should be no whistling. Then hitch him up and drive him, to see that he carries his front and hind legs well and that he has good action, also noticing whether he carries his tail straight or not. If for draft, hitch him to a load of some kind to see how he pulls. Now put him in the stable for an hour or two, giving him a pail of water and a feed, for in some cases of lameness, the animal will not show it until he has stood for awhile. After this, go into the stall and take the horse out yourself, noting how he steps over and how he backs out, for fear of string-halt and chorea. After this give him another trot to test for lameness and soundness of wind. A person

cannot be too careful in examining a horse, as there are so many troubles, it is easy to overlook some conditions that may prove more or less serious.

FORMS OF GUARANTY OR WARRANT OF SOUNDNESS.—

When a horse is bought on a guaranty, the language should be concise and comprehensive. Equivocal language and verbiage is the resort of tricksters, who wish by this means to deceive, and honest men should avoid the appearance of evil. The following are good:

Received of Mr. ....., ... Dollars, for ....., warranted ..... years old, and under ..... years, sound, free from vice, and quiet to ride or drive.

Signature .....

The place, date of purchase, the name of the person who pays, the amount paid, the description of the animal with pedigree, if any, and reference to the proper stud book, and the age, should be filled out and signed by the seller. A form fully filled out might read as follows:

DETROIT, MICH., June 15, 1904.

Received of John Adair, seven hundred and fifty ($750) dollars, for the dark bay imported stallion Imperial; black mane and tail, and one white hind fetlock. Sire, Alexander; dam, Alicia, etc., as contained in the stud book. Said stallion is warranted five years old, and under six years old, sound, free from physical defect, and safe and quiet to ride or drive.

(*Signed*) ARTHUR Q. MCKENZIE.

This covers the ground, and may be changed to suit any transaction in the buying of a horse.

A bill of sale might read as follows:

DETROIT, MICH., June 15, 1904.

For and in consideration of the sum of ..... Dollars (or, if a note is given for the whole or part, state this fact). I have this day sold to John Adair, the horse etc , etc. (as in the other form).

TO TELL THE AGE OF HORSES

BY O. R GLEASON

To tell the age of any horse,
Inspect the lower jaw, of course;
The sixth front tooth the tale will tell,
And every doubt and fear dispel.

Two middle "nippers" you behold
Before the colt is two weeks old.
Before eight weeks two more will come;
Eight months, the "corners" cut the gums.

Two outside grooves will disappear
From middle two in just one year.
In two years from the second pair;
In three the corners, too, are bare.

At three the middle "nippers" drop;
At four the second pair can't stop.
When five years old, the third pair goes.
And then a full new set he shows.

The deep black spots will pass from view,
At six years from the middle two.
The second pair at seven years;
At eight the spot each "corner" clears.

From middle nippers, upper jaw,
At nine the black spots will withdraw.
The second pair at ten are white;
Eleven finds the "corners" light.

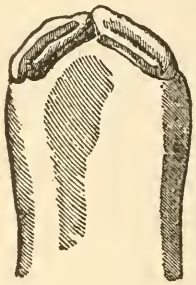
As time goes on, the horsemen know
The oval teeth three-sided grow;
They longer get, project before,
Till twenty, when we know no more.

HOW TO TELL A HORSE'S AGE BY HIS TEETH.—In buying horses it is often desirable to be able to judge of the approximate age of the animals. With a little experience this can be done quite accurately by examining the teeth. In judging, we may confine ourselves almost entirely to the lower front teeth, called the lower incisors. In the horse there are six of these, and they are named as follows: The two middle ones are called the central incisors, the ones on each side of the centrals are called the laterals, and the ones next to these, or the outer ones on each side, are called the corners. Those on the upper jaw are named the same, but we need not study them in judging age. The back teeth are called the molars, or grinders, but these do not aid in judging of the age, except at one period, which will be mentioned later. In structure, the teeth are made up for the most part of a hard, bone-like substance called dentine, the outside being covered over with a still harder substance, the hardest in the body, known as enamel. The enamel not only covers the outside of the tooth, but dips down into the tooth at various places. In the molars it dips down in a number of places, and being harder than the surrounding dentine wears away more slowly, and hence keeps the grinding surface of the tooth rough. In the incisor teeth the enamel surrounds the cups, which are in the grinding surface of these teeth. This enamel, which dips down into the substance of the tooth, is called the internal enamel to distinguish it from that on the outside of the tooth, called the external enamel.

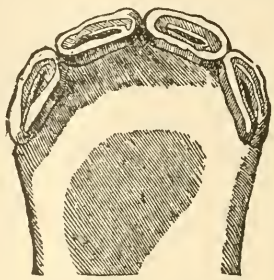
The horse has two sets of teeth; the first, which are called the temporary, or milk teeth, are twenty-four in number, twelve in each jaw; six incisors and six molars, three molars on each side. The second set, which are called the permanent teeth, are forty in number, six incisors, twelve molars, and two canines, in each jaw. The canines are generally absent in the mare; they are the sharp-pointed teeth in the space between the incisors and molars. The canines and the fourth, fifth and sixth molars are not present in the temporary set, and hence the horse has only one set of these teeth.

At birth the colt generally has the central incisors in both lower and upper jaws, four front teeth; sometimes these do not

come through for a week or ten days after birth. At eight to ten weeks the lateral incisors on each jaw come through, and at about ten months the corner incisors come in. The colt now has a full colt's mouth, all his temporary, or milk teeth, as they are called. The temporary back teeth, or grinders, are in at birth.



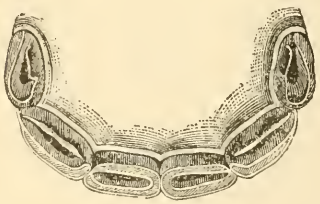
Eight Days.



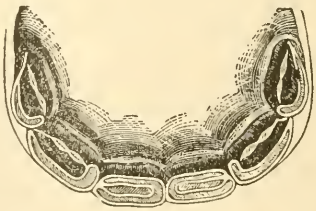
Two to Three Months.

The fourth molars, the first permanent teeth, come in at about ten months of age, but they need not be considered for judging age, as the corner incisors come in at that time, and the age can be judged by them.

At from twenty months to two years the fifth molars come in, and as there are no very marked changes in the incisors at this age, the presence or absence of the fifth molars helps us in judging at this time. This is the only time when it is necessary to refer to the molars in judging age.



Eight to Ten Months.



One Year.

The next change noticed in the teeth is the shedding of the temporary, and the appearance of the permanent teeth. The permanent teeth are formed down in the jaw underneath the

Two Years.

Two and One-Half to Three Years.

roots of the temporary ones, push up against the roots of the temporary, absorbing a large part of the root, and pushing out the remainder of the tooth. The first of these changes takes place with the teeth at from two years nine months to three years, when the temporary central incisors are shed, and the permanent ones take their place; it is about three months from the time the permanent teeth appear, until they are in wear. The permanent teeth are much larger than the temporary, so there is no danger of mistaking them.

The next change is at from three years nine months to four years, when the lateral incisors change. The four-year-old colt then has four large permanent incisors in each jaw and the two small temporary corners.

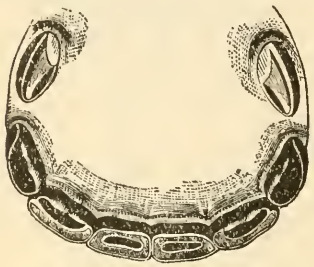
Three and One-Half to Four Years.

Four and One-Half to Five Years.

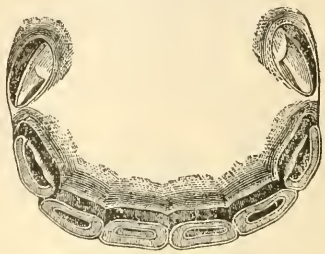
At five the corner incisors change; the colt now becomes a horse, having all his permanent teeth, the permanent grinders having replaced the temporary ones during the last two years, and the sixth molars and the canines having come in during the last year. Technically speaking, the male animal under five

years of age is called a colt; past five, a horse. The female under five is called a filly; past five, a mare.

After five the age is judged by the way the teeth wear away. When the tooth first comes in wear, there is in the grinding sur-



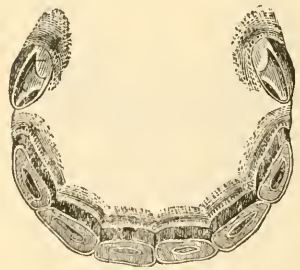
Five Years.



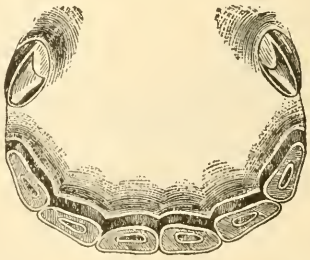
Six Years.

face, a cone-shaped cavity, commonly spoken of as the "cup," and as the tooth wears away this cup becomes shallower and smaller; as the teeth come in wear at different periods the cups in the different teeth wear away at different ages. Surrounding the cup is a thin layer of a very hard substance called the internal enamel; being harder than the rest of the tooth, it wears away more slowly and projects above the rest of the surface.

At six the cups in the lower central incisors are becoming small and shallow, but not entirely gone, the cups still being fair size in the laterals.



Seven Years.



Eight Years.

At seven the cups are gone from the central incisors and becoming shallow in the lateral incisors.

At eight the cups are gone from the lateral and getting shallow in the corner incisors.

At nine the cups are gone from the corner incisors, and from this time on we cannot judge the age with the same degree of accuracy.

We referred above to the internal enamel surrounding the cups; when the cup is gone this internal enamel will be recognized as a thin, whitish layer, forming an oblong ring in the center of the grinding surface; it shows more plainly when the mouth is so held that the sun shines on the tooth, or it can be felt by passing the finger over the surface. As we have said, when the cup is first worn away, the ring is oblong and quite large, but as age advances it becomes smaller and rounder, and finally disappears entirely; then the surface will feel smooth to the touch. After the animal is nine yeas old we note the shape and size of this ring of internal enamel in judging the age.

At ten the ring of internal enamel in the lower central incisors is becoming quite small and round, but not entirely gone.

At about twelve the enamel is gone, or nearly so, from the centrals, and small in the laterals.

At about fourteen the enamel is gone from the lateral incisors, and small in the corners.

At about sixteen the enamel is gone, or nearly gone, from the corner incisors; and after this we can judge the age only by the general shape of the teeth.

The foregoing rules are more reliable when the upper and lower teeth oppose each other perfectly. Sometimes the upper teeth project beyond the lower; if the defect is only slight it will not cause much variation; if bad, however, it will prevent judging the age, as the lower teeth will not wear away. We also sometimes find that one side wears faster than the other; upon looking at the corner tooth on one side we might judge the animal fifteen or sixteen, while the other corner might indicate only twelve. So in judging age consider all the points; do not form an opinion from one or two teeth.

In addition to the specific changes in the teeth already mentioned there are certain other general changes, which help to determine whether a horse is old or young.

As an animal grows older the shape of the arch and also the shape of the teeth change. In the young horse, one seven or eight, the upper teeth extend nearly straight down and the lower up, meeting each other in such a way that the front surface of the upper and lower teeth form nearly a straight line; as the animal grows older, both upper and lower teeth project forward and from an angle with each other, this angle becoming sharper as the animal advances in age.

In the young horse the teeth are broad from side to side, and narrow from before back; as the animal grows older the teeth get narrower from side to side and wider from before backward.

In endeavoring to judge the age of a horse, then, first see if the upper and lower incisors oppose each other perfectly, and also if those on one side of the centrals are wearing the same as those on the other; if these conditions exist the age can be judged with a good degree of certainty; if they do not, allowance must be made for any irregularity. Anyone by using the foregoing rules can, with a little experience, become quite proficient in judging the age of horses.

Independent of the teeth, the general indication of old age are: Deepening of the hollows over the eyes; gray hairs over the eyes and about the muzzle; pendulous lips with a wrinkled appearance; sharpness of the withers, sinking of the back, etc.

The value of an old horse so far as his teeth are concerned, will depend very largely upon the condition of the molars, as these are really the working teeth. If these teeth are still fairly large, their grinding surfaces rough, and the grinding surfaces on the same straight line, they are in condition to grind the food in good shape; if, on the other hand, they are getting small, the grinding surfaces are smooth and some are longer than others, not much can be expected of them by way of preparing the food, and the animal will be of little value.

OPERATIONS

Whenever it is possible, all operations, except a few simple ones, should be left to the veterinarian, but for the benefit of those who cannot secure a veterinarian, a few of the operations will be considered.

SOME IMPORTANT POINTS.—Whenever possible, deaden the pain of an operation by using either local or general anæsthetics. Never inflict unnecessary pain. Secure the animal so he cannot hurt himself, or those assisting. Have all instruments used, perfectly clean, placing them, a little while before operating, and keeping them, when not in use during the operation, in a solution of Carbolic Acid, ½ ounce, water, 1 pint. Have the hands clean, and operate in a place free from dirt and dust.

LOCAL ANÆSTHETICS are those preparations which destroy sensation in the part to which they are applied; one of the best is a solution of Cocaine; an eight per cent. solution is generally used, except when applied to mucous membranes, then a five per cent. solution is used. Have a druggist make up the solution. In sewing up wounds about the head it is sometimes difficult to hold the head still; by rubbing the edges of the wound with a little of the solution, all the pain is deadened; in opening an abscess, if the skin is rubbed well with a little of the solution for five minutes, then wait a few minutes, it can be opened without pain; very valuable in those places where a little movement of the animal is apt to interfere, as about the knee or hock. In cutting out tumors, by injecting a drachm under the skin with a hypodermic syringe in three or four places around the base of the tumor, and then rubbing around the tumor, it can be removed with very little pain. Much of the pain can be destroyed by rubbing the surface of the tumor as in opening abscesses. A few drops of a five per cent. solution dropped into the eye, will destroy the pain in operation upon that organ. Never use more than an ounce of the solution during an operation, and not much more than one-half ounce if injected under the skin.

GENERAL ANÆSTHETICS.—These are the drugs which produce unconsciousness and loss of sensation. Those most used are Chloroform and Sulphuric Ether, and are given by inhaling the vapor. There is danger, in using them, of their causing death by stopping respiration and the heart's action, and so they should only be used by the experienced, except in extreme cases. Anæsthetics should, however, be used in all the severe operations. Chloroform is most used with horses and cattle; Ether with dogs. The animal is thrown and secured, a sponge is then saturated with the drug to be used, and put into a bag one-half the size of a grain sack, the nose put into the bag, and the bag held fairly tight around the face, below the eyes; sometimes a paper flour sack is put inside the other sack, and the sponge put into this; with this there is some danger of giving chloroform too fast, as some air should always be given with it. Another way is to cover the cloth sack with a rubber blanket, and this can be held down to prevent the chloroform from wasting, and yet kept open enough to admit sufficient air. If the chloroform sack is made of thick canvas it need not be covered at all. In case of death, respiration stops a little before the pulse, and so this act should be carefully watched, but the finger should also be kept on the pulse, and if either of these acts show indications of stopping, remove the sack at once and let the animal inhale the fumes of Ammonia. To tell when the animal is under the influence of the drug, the eyeball is touched with the finger; when unconscious, he will not wink. The sack is then removed and a few breaths of pure air are given, and then the sponge is so fixed that he will get a little chloroform with each breath, the larger part being air; if he commences to become conscious, more chloroform is given for a few seconds, or until he goes under its influence again. These drugs affect different animals differently, and so each case needs careful attention. From three to four ounces of chloroform is required to put a horse under its influence, and keep him there an hour.

THE KNIFE.—Almost any knife will answer for operating, if not too large to be awkward to handle. A medium sized, one-bladed jack-knife, with a blade some two and one-half inches

long and half an inch wide, answers very well. It should be perfectly clean and very sharp. A dull knife inflicts much more pain than a sharp one. The knife is held in different ways; when doing careful dissecting, much as a pen is held in writing. When a firmer grasp is needed, and the tissue is to be cut down onto, hold as follows: open the knife and lay it on the table, sharp edge of blade down; now pick it up, clasping the blade between the thumb and first finger, a little back of its middle. If the cut is to be made by an upward stroke, or where there is to be simply an inward thrust and an immediate withdrawal, as in opening an abscess, hold the knife as follows: open it and place it on the table with back of blade down; now pick it up, clasping the blade between the thumb and first finger, just far enough from the point to cut the required depth; holding in this way, the thumb and finger acts as a shield and prevent too deep cutting. Make a cut with as quick a movement as it is safe to make, as the pain is less than with a slow movement; also make as few strokes as possible, as a cut two inches long made with two strokes causes twice the pain it would if made with one stroke.

METHODS OF CONTROLLING ANIMALS.—

A Twist.—To make a twist, take a piece of fork handle about two feet long, and one inch from one end, bore a three-eighths-inch hole; through this put a one-fourth-inch soft rope, about one and one-half feet long, and tie the two ends together, forming a loop. To apply it, take hold of the stick with the right hand, slip the left hand through the loop and clasp the upper lip well up towards the nostrils; slip the loop off the hand onto the lip, and twist the stick until the loop is so small it will not slip off. The upper lip is very sensitive and a horse can be held in this way and allow operations he would not allow without it. Do not turn the twist tighter than is necessary, as it can be made a very inhumane instrument, and if twisted too tight, or kept on too long, may paralyze the lip.

Blindfolding.—By blindfolding a horse, he will submit to operations he would not submit to, if not deprived of his eyesight. It is always well to blindfold in throwing a horse; he will not resist so much.

The Side-Line.—This is a means of holding one hind foot off the ground, and prevents serious kicking when working about the hind legs (see cut). Apply the side-line to the leg that is not being operated upon.

Holding Up One Front Foot is also a means of controlling a horse; the foot on the side the operator is working, if about the hind legs, is the one to pick up.

Stocks.—Animals can also be confined in stocks. Temporary stocks can be made by setting two posts about three feet from the side of a building and eight feet apart; nail on the inside of the posts, up some three feet from the ground, a good, strong plank; also nail across from one post to the building a strong plank; have one or two rings securely fastened to the building opposite the side plank; lead the horse into the stocks and pass over the back, and securely fasten to the rings and the side plank, a rope, much as a kicking strap is put on a colt. This is a good way to secure animals for dressing wounds when they are inclined to be vicious.

Casting.—The most effectual way to secure a horse is to lay him down, but as there is a little danger in this, especially with an aged animal, it is not done when other means will answer, but in some cases it has to be resorted to.

There are many ways of casting a horse. The chief point is to throw him carefully so as to not injure him in any way. A very good way is to put hobbles on the feet, and run a chain through the D's and draw the feet all together, having a rope running from one arm over the back, to make him fall on desired side. A good man should be at the horse's head to prevent him throwing it around and falling on it, and thus breaking his neck, or lunging forward onto his head. Have a good bed for him to fall on. Another good plan, without hobbles, is Rarey's. Tie up the fore leg, then tie a strap to the pastern of the other fore leg and pass it over the horse's back; standing at the shoulder, push him over a step, at the same time pulling up the foot and bringing him to his knees. He will do some rearing and jumping about, but when he gets tired he will lie quietly down, when his

THE SIDE-LINE.
See page 350.

CASTING, OR THROWING
See page 350.

legs can be tied and held down. To prevent him pounding his head, have a good man there, who should put one knee on his neck, and turn his nose up at an angle of forty-five degrees. As a safeguard against too severe straining, tie a rope from just above one knee to above the hock of the leg on the same side, and draw the legs as closely together as possible, and confine them there. This lessens ability to struggle. The double side-line is also used, as per "cut," and as described under CASTRATION.

OPENING AN ABSCESS.—This is not a difficult operation, but if not done properly it is of little use, and is apt to retard a cure. When ready to open, ascertain as near as possible where the bottom is, and insert the knife at that point, making an opening quite to the bottom for the escape of the pus. If this is not possible, open at the top, and evacuate with a sponge or syringe. The main point to bear in mind is to open as near as possible to the bottom. A twist on the nose is usually sufficient to keep the animal quiet. After opening, flush out well with water, using a bulb syringe, and then inject a little Carbolic Acid lotion—½ ounce of the acid to a pint of water. Flush out each day for four or five days and then once in two days until healed. If the opening gets small before the abscess heals, as it will if the abscess is large, enlarge it; if it closes before the abscess heals from the bottom, it will form again. In treating old abscesses having an inside lining, it is well to inject a drachm or two of Iodine into them every other day for a few days. Or, tie together, along on a string, a few small wads of cotton batting; saturate these with the Tincture of Iodine, and press them into the abscess, leaving the ends of the string hanging out. Leave in twenty-four hours and then remove by pulling on the string.

In some cases it is well to poultice an abscess a few days after opening; this is especially good if the abscess has just formed.

BLISTERING—(See under "Ring-Bone)."

PUTTING IN STITCHES.—Following operations, and also where the skin and muscles are cut accidently, it is often desirable to draw the edges of the wound together with stitches, or

sutures. Of these there are four kinds: The interrupted, the uninterrupted, quilled, and twisted sutures. The interrupted suture is the one generally used. For this, needle and silk, or silver wire, or cat-gut, are needed. Clip the hair from the edges of the wound, and be sure that everything is clean. Draw the edges of the wound together with a slightly curved needle and silk, and when tying the knot give the ends an extra turn in making the first part of the knot, which will keep it from slipping back (the surgeon's knot); then go on and make a hard knot in the usual manner, and cut off the silk. Then another, and so on.

The continuous or uninterrupted suture sews up the wound by continuing right along, as in sewing cloth, and in tying the ends. The quilled suture is when two quills, or pieces of wood, are used as skewers, and the end of the silk caught over them, the quills being placed one on each side the wound, to prevent tearing out. The twisted suture is simply a pin inserted through the edges, and a hair, or silk thread, wound around its ends in the form of a figure 8. Before sewing up a ragged wound, cut off all ragged pieces of tissue from within the wound before drawing the edges together; draw the edges so they just nicely touch, and leave a little opening at the bottom for drainage. It is hard to pass an ordinary needle through the skin, and so it is much easier to use a surgeon's needle, or in the absence of this, the old-fashioned buckskin needle will answer.

BANDAGES.— In the treatment of lameness, especially strains, when in the legs, and also in the stopping of hemorrhages and dressing of wounds, bandages are often used. For lameness and dressing wounds, stopping bleeding, etc., coarse, unbleached muslin answers very well. For moderate pressure, as in the case of wind-galls and stocked legs, the Derby bandage, sold by harness makers, is good. Elastic bandages are good when tension is required, but need careful attention to avoid irritating the skin. Three or four inches is a convenient width for a bandage. To apply it, first roll the bandage up into a snug roll, and, commencing at the bottom of the part to be bandaged, wind it around the part, unwinding the roll as it is applied. Keep the bandage

smoothed out, and overlap about half each time around; about every second or third round, turn the bandage half way over, or this can be done at each round; this keeps it tight and in place. Secure the upper end of the bandage by tying with a string. Bandages should be applied tight when used with strains; loosely when used to cover wounds.

PASSING THE CATHETER.—The catheter is a tube for drawing the urine from the bladder. With the horse it needs to be a little more than two feet long, and is a tube made especially for the purpose. With the mare any small, rubber tube six or eight inches long will answer. To pass it into the horse, stand at the left side, pass the left hand up into the sheath, get hold of the penis and gently draw it down so the end shows below the sheath; near the center of the penis will be seen the opening. Have the catheter clean, warm, and well oiled with melted lard; take it in the right hand, insert the end into the opening in the penis and keep gently pushing it in; have an assistant raise the tail and watch the skin just below the anus, and when the catheter is about two-thirds passed, he will notice the skin bulge outward; have him press upward and forward and the catheter will round the arch, and can be pushed on into the bladder. In the mare the operation is much simpler; the opening into the bladder will be found on the floor of the vulva about five inches from the posterior opening. The first finger of the right hand can be passed into the passage and the opening located, and then the tube can be passed with the left hand underneath the right, and directed into the opening and pushed on into the bladder, which will be only two or three inches.

FOMENTING.—By fomenting is meant the continual bathing of a part with hot or cold water. It can be done with a sponge, but this is more work and not so effectual as when the part to be fomented is wrapped with a heavy blanket and this kept wet with hot or cold water; the water should be re-applied at least every half hour. For inflamed glands, or where there is great pain, use hot water; at other times cold can be used. The effect is about the same with either. Lukewarm water is no good. In towns,

or in the country where the farm has waterworks, a hose can be fastened under the blanket and a stream of water allowed to run continuously. Another way to foment the fetlock, or below, is to

TUB.—This is allowing the horse to stand in a tub of water. The end of a kerosene barrel makes a fairly good tub, only it is a little small; but if placed in one corner of the stall the horse can be made to step into the tub, and tied so he will stand there. Must be careful in getting him into it the first time, not to frighten him. A tank some eight inches high and three feet square, can be made out of plank, that answers nicely for tubbing. The water should be changed twice a day, or ice can be added to it and the water kept cold in this way. Another way to foment the feet, or rather to poultice them—for the two operations are practically the same—is to stand the horse in a puddle of blue clay. Any box large enough, and six or eight inches high, can be used to puddle the clay in.

TAPPING THE CHEST.—In hydrothorax the chest fills with water; it is the stage of effusion in pleurisy. The lungs are floated up, and suffocation results. The presence of water is detected by the solid sound—the sound of fullness—when tapped with the hand, and by the absence of the respiratory murmur; and often, the splashing of the water by the action of the heart can also be heard.

Clip the hair from a spot about three inches back of the elbow, and five or six inches from the bottom of the chest. Ascertain the exact location where a puncture can be made without striking a rib, keeping in the middle between two; cut through the skin with a knife, then insert the trocar and canula and withdraw the trocar, leaving the canula to act as a spout; hold a pail to catch the water. Should pieces of lymph clog the canula, pass a small probe and push them off the end. Drain off all the water and withdraw the canula. It is often necessary to repeat the operation, in which case, use a new opening. Have the instrument very clean.

TAPPING THE BELLY.—In peritonitis the belly often fills with water, which can be evacuated by inserting the trocar

and canula on the median line, a couple of inches back of the navel, following general lines as to care and operation, as in "Tapping the Chest." The operation may be repeated, if necessary, but make a fresh incision, rather than to insert again in the former wound.

TAPPING THE FLANK FOR FLATULENCE.—See "Flatulent Colic."

THE HYPODERMIC SYRINGE.—This is a small syringe, with a hollow needle attached, for injecting medicines underneath the skin. To use it, first wash it out with the Carbolic lotion, by drawing the syringe full and then forcing it out; then draw into the syringe the dose of the medicine, take the syringe in the right hand, clasping the needle between the thumb and first finger, about an inch from the tip; grasp it firmly, pick up a fold of the skin with the left hand, and with a quick thrust, push the needle through the skin, and force out the fluid. Medicines can only be given in this way when the dose is small and the drugs non-irritating. The syringe is used for injecting Cocaine solutions in operations.

GIVING A DRENCH.—For holding the horse to give medicine from a bottle (see cut). The twist is put on only moderately tight, simply to hold the head still and make the horse swallow better. Hold the head up with the rope, not with the twist. If the ceiling of the barn is high enough, fasten the ring in the ceiling well towards the front end of one of the stalls; and when giving medicine, back the horse into the stall. The looped strap is passed under the noseband of the halter and into the mouth, around the upper jaw; see that it does not press the edges of the lips in against the teeth. This leaves the tongue and lower jaw free for the act of swallowing. If the horse refuses to swallow, remove the bottle and tickle the roof of the mouth with the finger. Medicine can also be given, when the dose is small, by throwing it into the back part of the mouth with a hard rubber syringe.

TUMORS AND THEIR REMOVAL.—Tumors may be described as any unnatural enlargement upon the body. They

differ very much in nature and structure, some being composed of the same kind of tissue as that in which they are found, others being made up of an entirely different tissue than that which surrounds them. The tendency with some is to keep on growing; others remain the same size after once formed. Some tumors can be removed; others, on account of their location, or structure, cannot be removed.

To remove tumors, some, if not too large, can be absorbed by using Iodine Ointment, see treatment for "Abscesses." Others have to be dissected out. To dissect out, large blood vessels must be guarded against. Control the animal by some of the methods, a twist is frequently enough; use Cocaine to deaden pain, see "Local Anæsthetics" in this section. With a sharp knife make a cut up and down through the skin, over the center of the tumor; then dissect the tumor from the skin, first on one side, then on the other, and then dissect the tumor from the tissues underneath it. If any large blood vessels are cut, twist them, or take up and ligate, see "General Treatment of Wounds." After the tumor is out, remove a little of the skin from each edge of the cut, so it will lie close and not form a pouch when sewed up. Sew up the upper part of the skin wound, leaving the lower open for drainage; follow with treatment as for an ordinary wound. If there is some thickening left after wound has healed use the Iodine Ointment.

TRACHEOTOMY.—This is opening the trachea, or windpipe, and inserting a tube into it, to prevent death from threatened suffocation. The tube should be three-quarters of an inch in diameter, curved so as to slip into the windpipe easily, with a plate at the end, of like material, to tie to the neck to keep it in place; silver or hard rubber tubes are generally used. Open the skin by an incision about two inches long, at a point about eight inches below the throat, where the windpipe is close to the surface; divide the muscles, and lay bare the windpipe; then cut out a circular piece, including two rings, making a hole large enough to insert the tube. Once a day take out the tube, clean it with Carbolic lotion and replace as soon as possible. The tube may be removed for good when the cause of suffocation is removed.

The wound will soon heal. While the operation seems somewhat dangerous, it is simple; the principal point is to have instruments clean and not to drop the circular piece cut out, down into the trachea. The operation becomes necessary sometimes in bad cases of distemper or laryngitis.

SPAYING.—This operation is rarely ever performed on mares, except in case of disease, and as it is a dangerous operation, should only be performed by a skilled man. It consists in removing the ovaries.

FIRING (ACTUAL CAUTERY).—This is burning with a red-hot iron to set up a great amount of counter-irritation or inflammation. It is mostly used for ring-bones, spavins, curbs, and sprains of the back tendons. It should never be performed except by a veterinarian.

There are a large number of other operations performed upon the lower animals, but they are of such a nature that only the veterinarian should perform them.

CATTLE

THEIR DISEASES AND TREATMENT

ANATOMY OF CATTLE

Each of the bones and joints of the ox receive the same name as the corresponding ones in the horse, but there are a few important points of difference in the structure of the skeleton. The ox has thirteen pairs of ribs, while the horse has eighteen pairs. The breast-bone or sternum is much larger and flatter than in the horse, and the cartilages of the ribs attach to it with true joints; this is important to keep in mind, for when there is any disease of lungs or chest in cattle, they always lie down, as when they take that position, the chest is expanded and animal gets more relief than when standing. In the horse the case is reversed, the ribs and the breast-bone being so formed that the chest is contracted when lying down, hence in diseases of the lungs, the horse stands instead of lying down.

The bones of the head in the ox differ from those of the horse in being very heavy and wide at the upper part of the skull, and the skull has a bony projection at each side, called the "core of the horn." This is important to know in dehorning, and all interested in that work should become familiar with the fact. This projection, or core of the horn, is hollow, which is a continuation of the sinuses or cavities of the bones of the head. Attached to the core of the horn and covering it, is the horn itself. Another point of difference between the ox and the horse, is that there are in the heart of the ox two small bones, called cardiac, or heart bones. There are no such bones in the horse. One more point of difference is that the bones of the feet of the ox are divided into two parts, while in the horse they are without division.

PEACE AND PLENTY.

THE ORGANS OF DIGESTION.—

The Upper Lip of the ox is thick, hard, and hairless, the color varying with the color of the animal, and when in good health this part is always moist; it is called the muzzle.

The Cheeks on the inside are covered by numerous little processes, which give them a very rough appearance.

The Tongue of the ox is stronger than that of the horse, is more prehensile, and is very thick and heavy at the base; it is pointed at the front end, and the upper surface is very rough. It is by means of the tongue that food is gathered and taken into the mouth.

The Salivary Glands are similar to those of the horse.

The Teeth are much differently arranged from those of the horse; the ox has no front teeth in the upper jaw, their place being taken by a pad of cartilage or gristle. The lower row of teeth presses against this pad in grazing, and its function is that of teeth, but it may be easily seen that cattle cannot thrive on as short pasture as though they had both lower and upper incisors. The front teeth of the lower jaw are eight in number, chisel shaped, and set loosely in the gum. The molars are similar to those of the horse, but are smaller, and not so smooth on upper surfaces. These are twenty-four in number, which, added to the eight front teeth, give a total of thirty-two teeth

The Soft Palate of the ox is small, and does not close the opening from the mouth to the pharynx as in the horse.

The Pharynx in the ox is much larger than in the horse. The esophagus, or tube of the throat, which conveys the food to the stomach, is well developed; the fibres in it are very strong and have a double action. When the animal is eating they carry the food from the mouth down into the stomach, but during the time of ruminating, they act in a reverse manner, conveying the food from the stomach to the mouth, and returning it again to the stomach when sufficiently masticated.

The Stomach is a very important organ to study, for cattle suffer much from diseases of the stomach. The stomach of the ox has a capacity of about sixty gallons, and has four compartments. The first is the paunch, or rumen; the second is the reticulum, or honey-comb; the third is the omasum, or manyplies; and the fourth is the abomasum, or true stomach. The first three prepare the food for the fourth, where the real process of digestion is carried on. The paunch, or rumen, is very large, and in an old animal it fills up nearly three-fourths of the belly cavity; it lies up against the left side of the belly, where it is attached and held in place by ligaments. Its situation is important to remember, for in many of the diseases of the paunch, or rumen, it is first noticed on the left side, and in tapping the paunch for bloating, the entrance is always made on the left side, on account of its position. The paunch has two openings, an entrance and an exit, both of which are in front; the food passing from here into the reticulum, or honey-comb, which is the smallest division of the stomach. In this the entrance is at the front, and exit is at the rear; its office does not seem marked in food preparation, but may help in preparing the food to return to the mouth for remastication. From the reticulum the food passes into the third part, or omasum, which is the second largest division of the stomach. When full, it is ovoid in shape, and placed just behind the reticulum and at the right side of the paunch. This, if examined, is found to be full of folds or layers of membrane. The function of this part is, while food is passing through, to draw into its folds all the coarser parts of the food and to roll the same about until finely divided and well prepared to pass on into the abomasum, or true division of the stomach, where it is digested. When this part becomes deranged and the food becomes dry and hard between the folds, it then sets up the disease called "impaction of the omasum, or manyplies," or dry murrain. The food passing from here, as stated, goes into the fourth or true stomach. Here the food is digested. The walls of this part are redder than those of the preceding three, and they contain the glands that secrete the acids and gastric juices of the stomach, to aid in the work of preparing food for assimilation; this stomach corresponds to the stomach of the horse. From here the food passes into the small intestines.

The Bowels, or Intestines, of the ox are divided into large and small, the same as those of the horse, being similar in structure and in action. The small bowels are not quite as large as those of the horse, but about twice as long, being about 150 feet in length. The large bowels are very much smaller than those of the horse, being only two to three inches in diameter, and are about thirty-six feet in length.

When the fourth stomach has completed its work in the process of digestion of the food, it passes into the small intestines, and is acted on by the bile from the liver, and the pancreatic juice from the pancreas—these juices being emptied into the first part of the intestines through little ducts or tubes which lead down to the bowels the same as in the horse. After this, throughout the rest of the bowels, the nourishment of the food is taken up by little villi which are situated in the coats of the bowels, and the nourishment, when once in the blood, is carried out to all parts of the body, while the part that is not taken up, passes on and out in the form of manure.

THE LIVER.—The liver of the ox resembles that of the horse, but differs in that it has a gall-bladder resembling a pear in shape, and acting as a vessel to store up the gall during the time there is no digestion going on. During time of digestion, the walls of this vessel contract and the bile is forced down into the intestine.

THE PANCREAS.—The pancreas resembles that of the horse; the juice secreted by it having the same office to perform as in the case of the horse.

THE SPLEEN.—The spleen is the same in structure and use, but different in shape; it is oblong, and attached to the rumen.

THE RESPIRATORY, OR BREATHING ORGANS.—The organs of respiration in the ox are similar in structure and office to those of the horse, but in general are not so liable to disease, except tuberculosis, perhaps, which is somewhat common with cattle and rarely affects horses.

THE URINARY ORGANS.—The chief point of difference in these organs is in the kidneys, which in the ox are larger than in the horse, and instead of being smooth as in that animal, are rough, resembling a bunch of grapes. The bladder and passages resemble those of the horse, except that in the cow just back of where the urethra opens into the vulva, is a little blind depression which bothers in passing the catheter.

THE GENITAL ORGANS OF THE COW.—

The Ovaries of the cow are smaller than those of the mare, but are much the same in structure.

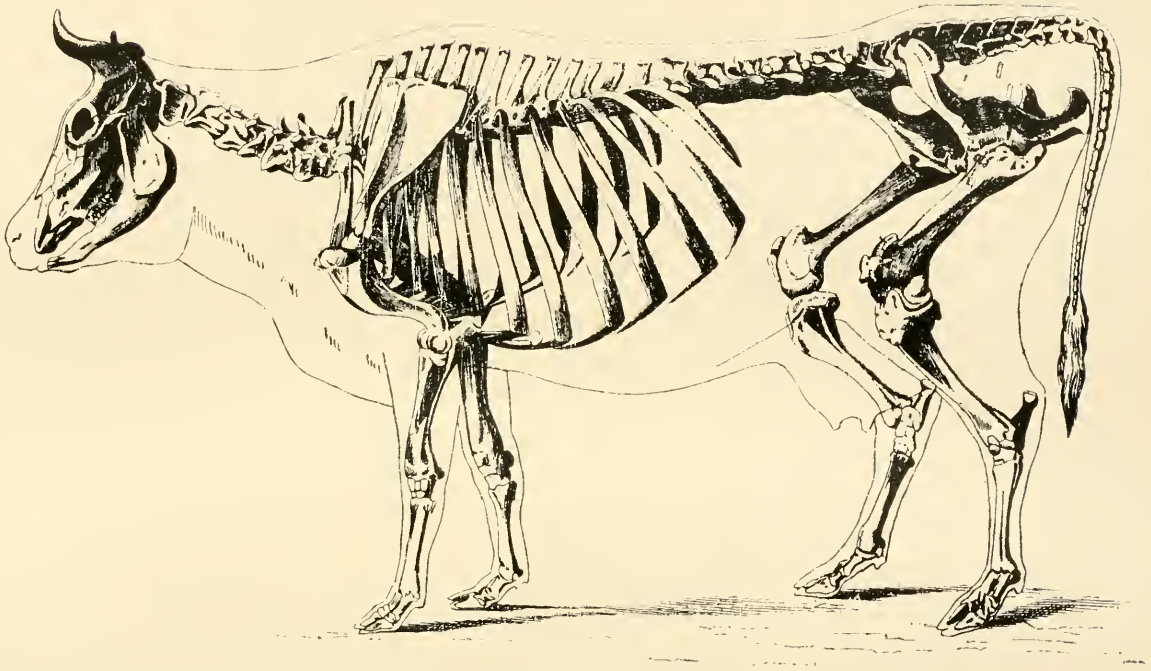
The Womb of the cow is somewhat like that of the mare, but the inside surface is different, being covered with button-like processes, very small when the animal is not pregnant, but increasing with gestation until, at the time of calving, they are nearly as large as a man's fist. These are called "cotyledons". The placenta, or after-birth, is attached to these, and some study should be given to them and their office by every stockman, since they are associated with some of the troubles attending calving. The passage, or vagina, is formed on the same principle as in the mare, but is not so long. The vulva is much the same, but the clitoris is very small.

The Udder, Mammary Glands, or Bag, should be pretty well understood. The bag is divided into halves, and these halves again divided, each part being known as a quarter of the bag, each quarter having a mammary, or milk gland, and a sinus, or pouch, to hold the secreted milk until the cow is milked. The sinus is situated just above the passage of the teat.

THE GENITAL ORGANS OF THE BULL.—

The Testicles.—The testicles are ovoid and well developed, lying vertical instead of horizontal as in the horse. The spermatic cord and artery are small, when compared with the horse.

The Penis.—The penis is long and pointed, and has an S-shaped curve in it, when not projected, just below the pubis or hip-bones; this curve may be felt with the fingers (if the bull don't object), just in the rear of the scrotum. The sheath is long



SKELETON OF THE COW.

and runs farther forward on the belly than with the horse, and has a tuft of hair on the point. When the penis is extended forward, as in serving a cow, the S-shaped curve of the penis straightens. The S-shaped curve prevents the passage of the catheter through from the end of the penis, as in the horse. The urethra has to be cut into just below the anus, where it rounds forward.

ACTION OF REMEDIES IN CATTLE

On account of a different make-up, remedies work quite differently in cattle than in the horse. Medicines should, as far as possible, be given them in liquid form, and in more bulky form than for the horse. The medicine should also be given slowly, as the chances are better for it passing into the fourth stomach. Cattle also take from one and a half to two times the dose taken by horses.

Aloes, though so excellent a purgative for horses, is not a good remedy for cattle, while Epsom Salts, that are cold and drastic for horses, on cattle work like a charm. Calomel and other forms of mercury act violently on cattle, salivating them soon, and in milch cows is excreted through the milk, affecting sucking calves seriously. Oils, used as purgatives, do not work very well on cattle; melted lard is perhaps the best. Mustard, as a blister, acts with more vigor on cattle than on the horse, but Turpentine acts with less.

PULSE, RESPIRATION AND TEMPERATURE

The normal pulse in cattle varies from fifty to fifty-five beats per minute; in old animals, and in calves especially, it is more rapid. The pulse is the most conveniently taken on the under border of the lower jaw, just in front of the angle, the same as with the horse. In health it is softer and less tense than it is in the horse.

The respiration requires no special skill to diagnose; this will come with practice. The soft, rustling sound of the healthy "respiratory murmur," when the ear is placed to the chest, is altogether changed when there is any disease affecting the lungs or air passages. The number of respirations in cattle per minute (usually twelve to eighteen) can be easily counted by the heaving of the chest. Some practice is required to make one a good judge of sound as obtained by percussion, which in health is always clear and resonant. Percussion consists in placing the forefinger of the left hand upon the chest, and striking it smartly with the ends of the first three fingers of the right hand.

The temperature in cattle—as in all animals—is an index of great value. It can only be arrived at, with any degree of satisfaction, with what is called a "clinical thermometer," which is so shaped that when taken from the body the reading remains the same until shaken down. It is inserted into the rectum and left two or three minutes and then removed and read. The normal temperature of cattle is about 101 degrees, a little higher than the horse. A rise of temperature above the normal is called a fever.

OTHER INDICATIONS OF DISEASE.—A "staring coat," as it is termed, in which the hairs stand like bristles, is an obvious symptom, and sometimes the only one, of a low state of health. Shivering, when animal is only exposed to moderate cold, or none at all, should receive prompt attention; for it is infallibly the ushering in of an attack of disease that is usually severe. Cold sweat coming out on the skin of an animal severely

ill, indicates a desperate if not a fatal condition. The posture when standing, the method of lying down or getting up, the action in moving around—all these are significant, and should be noted carefully.

The countenance, and especially the eye, will betray the distress and pain which the dumb sufferer is unable to express in words. The muzzle, which in health is moist—covered with "dew"—in fevers especially, becomes unnaturally hot and dry, or cold, and sometimes changed in color—sometimes paler but more commonly injected with blood. One of the earliest signs of constitutional disturbances, as well as of special disorders, is the suspension of rumination—ceasing to chew the cud. In the case of milch cows, a nearly coincident symptom is the drying up of the milk.

Inasmuch as cattle are not subject to the same conditions as the horse in many respects, diseases of some parts of the body are very much less common, although exclusive of lameness, nearly all the diseases of the horse are met with in cattle. In this work, where the treatment is the same, the reader will be referred to the treatment as given for the disease with the horse. To find the page in which the disease is described, unless given at the time, refer to the index.

DISEASES OF THE RESPIRATORY ORGANS

CATARRH, OR COLD IN THE HEAD.—Simple cold, or catarrh, is inflammation, more or less acute, of the membrane lining the nose and passages of the head, generally implicating the eyes and throat. Neglect in attending the early symptoms frequently occasions diseases of a more serious nature.

Causes.—Damp, drafty, badly drained stables; but generally from exposure to storms, and sudden changes in the weather.

Symptoms.—There will be more or less fever, as indicated by the thermometer; sneezing; cough sometimes accompanies; mouth is hot and nose dry; horns hot at the base and cold at tips; ears and extremities are cold. Discharge from the nose is at first watery, but in a day or two becomes purulent. Eyes are red and swollen, and inclined to weep. If not relieved, symptoms become aggravated; pulse rapid and hard; no appetite; urine scanty and high colored; bowels very apt to be constipated.

TREATMENT.—

Put animal in a comfortable, dry place, and give a small dose of Epsom salts (¾ to 1 pound); repeat in two days if bowels do not respond; give light, laxative food, and also the treatment as for the disease in horses, remembering that the dose is one and a half to two times as large. Steaming the head is as valuable as with the horse, and is done in the same way (see page 75).

MALIGNANT CATARRH.—This is a malignant disease affecting the chambers of the head, and causing offensive discharges from the nose. These at first are watery, but later on they become purulent, and in last stages are accompanied with extensive sloughing. It is contagious.

Causes.—Are not very well known, but thought to be due to minute organisms, perhaps belonging to the bacteria.

Symptoms.—It is ushered in with a chill, with all the attending symptoms of fever; the muzzle is hot and dry; animal hangs his head and isolates himself in the pasture; membranes are of a bluish color; eyes are closed and swollen; soon nose and eyes begin to run a watery fluid, and saliva drools from the mouth. Pulse is quick and not very strong; a dry, hard cough ensues; bowels are usually costive, feces being black and hard, but diarrhea may set in at any time. There is great thirst, but no appetite, and urine is scanty and high colored. In the course of twenty-four hours discharges become purulent, taking off the hair wherever they touch; passages of the head become so much inflamed and filled with matter, that when head is tapped on the outside with the fingers, a dull, heavy sound is heard. Breath becomes fetid, and temperature rises to 105 to 107 degrees. There is extensive

sloughing in last stage. Prostration is great; pulse becomes faint; convulsions follow, and a great fall in temperature; in some cases ulceration of the cornea takes place, letting out the humors of the eye. Death follows in from nine to eleven days.

TREATMENT.—

Put the animal in an isolated place, and have it cool in summer and warm in winter. Give a purgative to clear the bowels (1 to 1¼ pounds of Epsom Salts); also use the following to try and check the fever:

Fluid Extract Aconite.....	1½ drachms.
Fluid Extract of Belladonna.....	1 ounce.
Fluid Extract of Colchicum Seed.....	1 "
Saltpeter.....	2 ounces.
Water to make.....	1 pint.

Shake. *Dose:* 2 ounces, three to five times a day.

If fever runs very high give 2 drachms of Acetanilid and 2 ounces of Alcohol in half a pint of water, twice a day.

After two days, drop the Aconite from the foregoing prescription and put in the prescription in its place ½ ounce of Digitalis. Also steam the head, as in simple "Catarrh." Put 2 teaspoonfuls of Carbolic Acid in the water from which the steam is generated; also put in a little Camphor. The steaming is very important, and can be kept up most of the day. If the eyes become badly affected, treat as for "Inflammation of the Eyes." After the animal commences to improve, use tonics, as with "Chronic Indigestion." To prevent the spread, thoroughly disinfect where the animal is kept.

SORE THROAT—LARYNGITIS.—This is an inflammation of the larynx, or upper part of the windpipe.

Causes.—Are usually those of a common cold, but some animals seem predisposed to it, a slight exposure bringing on an attack.

Symptoms.—Animal may appear hungry, but does not eat, owing to inability to swallow; respiration becomes quick, painful and hurried; pulse is rapid; there is more or less fever, and if

water is taken, some of it is likely to return through the nostrils, owing to inflamed throat. Head hangs; ears droop; and saliva runs from the mouth.

TREATMENT.—

Give the same treatment as "Laryngitis" in the horse, remembering that the dose for cattle is one and a half to two times that for the horse. Also remember that the medicine is to be given in the form of a paste. Steam the head and apply liniments and fomentations to the throat as for the horse (see page 80).

MALIGNANT SORE THROAT.—This is a disease that centers itself in the throat in form of acute inflammation, followed by an effusion that is apt to cause suffocation by closure of the larynx. It is fatal to cattle; also to swine, in which it is known as "Quinsy."

Causes.—Probably due to some infection.

Symptoms.—It starts like a common cold-fever—injected mucous membranes, cough, etc.; throat swells enormously; tongue becomes spotted with purple and is protruded; animal gasps for breath, until at last he falls suffocated, struggles a little and dies. Disease usually attains its height in three or four days.

TREATMENT.

Use the same treatment as for simple "Laryngitis." Give the medicines in the form of a paste. Steam the head, using Carbolic Acid in the steam as for "Malignant Catarrh." Also use:

Chlorate of Potash	1 ounce.
Chloride of Iron	6 drachms.
Water	1 pint.

Mix. Inject 2 ounces well back into the mouth and throat, four or five times a day.

If speedy suffocation is threatened, the operation of tracheotomy must be performed (see OPERATIONS).

Apply liniments and fomentations to outside of the throat.

The animals that die should be buried deeply.

BRONCHITIS.—This is an inflammation of the mucous membrane lining the bronchial tubes, which extend from the lower end of the windpipe into the lungs.

Causes.—Exposure accompanying a common cold; or from the extension of inflammation in cases of catarrh and laryngitis.

Symptoms.—Loss of appetite; a peculiarly anxious expression of countenance; the respiration is painful and a slight grunt is noticed at each breath; a husky, wheezy and painful cough; on placing an ear to the windpipe, in the early stage, you get the tubular sound as with the horse, and later you get the rale. The temperature is elevated and pulse rapid and soft. Disease reaches its height in two to four days, and in favorable cases begins to abate in from five to eight days.

TREATMENT.—

Put in a dry, warm, and well-ventilated place, but avoid drafts. Apply Mustard paste mixed up with water, or water 2 parts and Ammonia 1 part, and rub well in at the base of the neck, over the windpipe, and on the sides. Keep body warm by blanketing. Use injections per rectum, to keep the bowels soft; avoid violent purgatives, but ½ pound of Epsom Salts may be given every second or third day. Aside from above, give treatment as for the disease in the horse (page 85), giving nearly twice the dose given to the horse.

FILARIA BRONCHITIS; HOOSE OR HUSK.—This is a disease that afflicts young cattle and sheep, more than older animals, for the reason, perhaps, that they graze closer than older animals, or else the parasites affect them more. It is caused by a parasite (strongylus micruris), the eggs of which are swallowed in feeding.

Symptoms.—There is a slight husky cough; the coat soon becomes staring; and the breathing more and more embarrassed. Cough becomes more frequent, and in character more suffocating and more mucus; worms, either single or in greater number, will be coughed up.

TREATMENT.—

Feed liberally with nutritious diet, including Linseed meal and roots, giving in the food.

Turpentine	1½ ounces.
Raw Linseed Oil	1 pint.

Give as a dose night and morning for two or three days, then discontinue for two or three days, then give again. For yearling calves give one-fourth the dose.

Burn turpentine on pine shavings in the pen with the calves, and let them inhale the fumes, or burn a little sulphur; care must be taken not to suffocate. The following is perhaps the most effectual treatment:

Turpentine	15 drops.
Carbolic Acid	5 drops.
Chloroform	8 drops.
Olive Oil	1 drachm.

Give as one dose by injecting into the wind pipe with a hypodermic syringe; insert the needle of the syringe in between two of the rings and inject slowly. The dose is for a good sized calf; it can be doubled for adult animals.

Prevention is better than cure. Stock should be kept off affected pasture, and cattle must not be allowed to drink from stagnant ponds. The drainage of low pastures should be looked after.

INFLAMMATION OF THE LUNGS — PNEUMONIA.—This is an inflammation of the lung tissue.

Causes—May come from a cold, exposure, etc., but oftener from the inflammatory conditions of bronchitis, or laryngitis extending into the lungs.

Symptoms.—This disease is preceded with a chill, staring coat, loss of appetite, cessation of ruminating, and if a milch cow, loss of milk. The pulse is soft, full, and quick; respiration rapid and heavy; temperature, 104 to 107. When the sides are tapped, a dull, heavy, full sound is heard, and on listening with ear to side, a crackling sound is heard, but in later stages there

will be no murmur in affected parts; in early stages expired air is hot; later is cold; ribs are fixed, breathing being done by the abdominal muscles; flanks heave, nostrils are dilated, and countenance has anxious appearance. In second stage, temperature generally drops 1 to 2 degrees; respiration difficult; cough painful and frequent; animal lies down most of the time; when standing fore legs are wide apart and elbows turned out; looks haggard; extremities alternately hot and cold; crackling sound no longer heard; and percussion gives dull sound. If one side only is affected, well side will show increased murmur.

TREATMENT.—

Place in a light, well ventilated box stall, and give the best of care and nursing. Feed laxative foods, and give small doses of Epsom Salts, 3 or 4 ounces daily; keep fresh water before the animal. Aside from the foregoing give the animal the same medicinal treatment as was recommended for the horse (see page 90); remembering that the dose is 1½ to 2 times as large. Use the Mustard or liniment applications to the chest freely. In some instances hot applications in the form of hot water bottles could be used to advantage. Blanket warmly. If seen during the chill, stop it as soon as possible, as recommended for the horse.

PLEURISY.—This is an inflammation of the pleura, or serous membrane which lines the chest cavity, and which is reflected over the lungs. If this disease is not attended at an early stage, its usual termination is hydrothorax, or water in the chest.

Causes.—The same causes which bring on inflammation of the lungs, bronchitis, and other diseases of the respiratory organs. Also external injuries to the chest, broken ribs, etc.

Symptoms—There is more or less fever; quick pulse, but small and hard, inclining to be wiry; breathing is quick and painful; elbows turned out; ribs are fixed, and breathing is done by abdominal muscles; a crease is seen extending from the elbows along toward the flanks, where ribs join the cartilages of the chest. Inspirations are short and imperfect, while the expirations

are prolonged and more easily affected. Pressure between the ribs causes pain, and a rasping sound is heard when the ear is applied to the sides; head hangs low; ears droop; nose is dry; and though eyes are partly shut, the countenance has an anxious look. There is no appetite; flanks are tucked up; hacking, painful cough; pains in chest cause animal to turn the head around to his sides. Unlike pneumonia, tapping on the ribs produces a clear, resonant sound, and causes pain; the expired breath is not hot, and there is no mucus rale as in bronchitis.

TREATMENT.—

Give the same general care as recommended in "Bronchitis" or "Pneumonia." Give 3 or 4 ounces of Epsom Salts daily, unless bowels act freely. Apply strong Mustard paste or Turpentine liniment to the chest and the internal treatment as for the horse (see page 91), giving nearly double the dose. If water collects in the chest, it is recognized and treated as given under "Hydrothorax."

HYDROTHORAX—WATER IN THE CHEST.—This is not a disease in itself, but is simply a condition where an excessive effusion of water takes place into the chest cavity in pleurisy.

Symptoms.—As soon as an effusion commences to take place, pain ceases, respiration is deeper, longer, and less painful; elbows no longer turn in; appetite returns; eyes get bright; and to a causal observer, animal appears to have taken a decided turn for the better. After a short time, however, there are unfavorable symptoms, as flapping of the nostrils, quick labored breathing, heaving of the flanks. The legs and chest become dropsical; eyes sparkle and countenance has an anxious look. No respiratory murmur is heard at the bottom of the chest, but increased at upper part, and later, a splashing may be heard when water reaches the heart. Percussion on ribs produces a full, dull sound at the lower part of the chest; pulse rapid, but small, and gradually fades away. Death comes from suffocation, the water crowding the lungs into too small a space in the upper part of the chest.

TREATMENT.—

If the drugs recommended for pleurisy have been given liberally, and yet the fluid has collected, medicinal treatment will fail; if the drugs have not been given, and the chest is not more than one-third full, by giving them, the fluid may be absorbed. If it cannot be removed in this way the chest will have to be tapped (see OPERATIONS). Continue treatment, as chest is apt to refill. See the disease in the horse (page 92).

DISEASES OF THE DIGESTIVE ORGANS.

WOUNDS AND CONTUSIONS OF THE LIPS.—

Causes.—From a blow by the horns of other cattle; from the whip of a driver of oxen; or from the bite of a snake.

Symptoms.—As a result of a bruise the lips are thick and swollen, and if neglected become hard and indurated, so much so that it is difficult to eat. In such cases the tongue is made use of to endeavor to gather and bring into the mouth the desired food. In case of snake-bite the swelling limits are not well defined; and it is soft and comparatively painless. If the skin is broken it will at once suggest the trouble.

TREATMENT.—

For a bruise, bathe the affected parts steadily three or four hours, twice a day with hot or cold water. Also bathe well with White Lotion, and the Turpentine, Witch Hazel, and Soap Liniment (see PRESCRIPTIONS, back part of book). If the skin is broken, treat as for "Wounds" in the horse (page 262). If from a snake-bite, make a cut through the center of the wound and then another at right angles to the first. Press a wad of cotton against the wound until the bleeding is nearly stopped, and then apply the following lotion several times a day:

Permanganate of Potash.....	2 drachms.
Water.....	1 pint.

As snake-bites are likely to result in depression, and later stupor, it is advisable to give ½ pint of Whiskey in a pint of water, repeating only often enough to prevent sinking into a stupor.

SLAVERING, OR SALIVATION.—This is a dribbling of saliva from the mouth.

Causes.—From a wound or the presence of any foreign matter in the mouth or teeth; from eating irritating plants, such as wild mustard; from the use of mercurial ointment; or as a symptom of other disease.

TREATMENT.—

This will depend on the nature of the cause. Examine to see if any foreign body is in the mouth. If from eating irritating plants, dissolve an ounce of powdered Alum in a quart of water, and syringe out the mouth with the mixture twice a day, using a half pint each time. If from the presence of a thorn, splinter of wood, or any foreign substance imbedded in the cheek or tongue, remove the offending object and wash the mouth occasionally with a weak solution of Carbolic Acid and water, ½ ounce to the quart; do not allow the animal to swallow much; also use the Alum solution. When the condition is produced by some disease, as by "Foot and Mouth Disease," follow the treatment given under the disease causing the trouble.

IRREGULARITIES OF THE TEETH.—This may be occasioned by the unequal wearing of some of the teeth or by some of the incisors being broken, which occasionally happens in cattle pastured on sandy or gravelly soil. The molars may also show irregularity from similar causes. Their edges may become sharp, or it may happen that a molar tooth has been accidentally fractured. In shedding, the loosened teeth get partially dislodged and cause trouble.

TREATMENT.—

Examine the animal's mouth by grasping the tongue with one hand and partially drawing it out of the mouth, so as to expose the incisors and molar teeth for inspection. When it is desired

to examine the molars with the fingers, an instrument like the balling-iron which is used for horses, or a large clevis held up edgewise, should be put into the mouth to separate and keep the jaws apart. Any sharp edges must be removed with a rasp. Any chance tooth that interferes with mastication, or any fractured or loose one should be taken out. In performing such operation it is advisable to have animal cast and to hold the head securely, so the operator can do what is necessary without difficulty. Whenever possible secure a veterinarian to operate if it becomes necessary to remove sound teeth.

CAPS ON THE TEETH—This sometimes occurs in cattle between the ages of 2 and 4 years, when they are shedding their milk grinders. Instead of teeth dropping out as they should, caps hang on the new teeth, causing them to fester at the roots, and causing a lump on the jaw-bone.

Symptoms.—Animal will hold its head to one side; has difficulty in eating, and sometimes spits the food out; will fall off in condition, and in time a lump will form on the jaw-bone opposite the festered tooth.

TREATMENT.—

Examine the mouth carefully until the capped tooth is found. This will be known by the tooth projecting above its neighbors. When found, remove with pincers, or even a hammer, and a long, somewhat blunted, chisel, by tapping gently until cap is knocked off.

DECAYED TEETH (CARIES) IN CATTLE.—

Symptoms.—The presence of decayed teeth may be suspected by the bad odor of the breath, and by the animal occasionally stopping while eating, and perhaps spitting out the food, and holding the head sidewise. If the mouth be examined, as directed in "Irregularities of the Teeth," and then explored with the hand, the bad tooth will be found.

TREATMENT.—

Have animal tied short and have the tongue pulled out and held. Then remove the tooth with a pair of large pincers, or by

forceps for that purpose. When the crown of the tooth has been destroyed, and only a stump, or root, is left, it cannot be drawn, but can be punched out; in such cases, if animal can be fattened, it is best to sell it to the butcher. If ugly, animal will have to be cast. Get a veterinarian to operate, if possible.

LUMPS ON THE JAW-BONES FROM TEETH OR FROM INJURY.—

Causes.—As stated in heading.

TREATMENT.—

If caused from a cap staying too long on the tooth, causing the roots to fester, remove the cap; do not pull the tooth at first, but try a blister on the lump. Use the Spanish Fly and Mercury blister (see "To Blister," page 257); or the Iodine Ointment, as used in "Abscesses," can be used. If the blister is used, repeat the treatment in four or five weeks, if necessary. If this treatment does not stop the lump from growing, throw the animal and pull the tooth with forceps. If the cause is from injury, treat as above. For other information as to lumps on the jaw, see "Actinomycosis of the Jaw-Bones."

INFLAMMATION OF THE TONGUE.—GLOSSITIS.—

Causes.—From eating irritating substances; from eating acid plants; or little blisters may form in the mouth of calves when having indigestion, constituting what is termed "Aphtha;" also from injuries from various kinds.

Symptoms.—The saliva dribbles from the mouth, and when examined, the surface of the tongue and other parts of the mouth will appear red and inflamed. In the case of calves, in the form of disease called "Aphtha," small, red elevations are seen on tongue and other parts of mouth, having little white points on their centers. These white patches are succeeded by ulcerated surfaces, which are exposed by the shedding of the white patches. In some cases the tongue is so badly swollen as to protrude from the mouth.

TREATMENT.—

When there is merely a reddened and inflamed condition of the mucous membrane of the mouth and tongue, syringe the mouth several times a day, using about 4 ounces at a time of the following:

Alum	2 ounces.
Water	1 quart.

When the edges of the tongue and other parts of the mouth are studded over with ulcers, these should be rubbed over once a day with the Nitrate of Silver, using the Nitrate of Silver pencil, or by holding a large crystal in a pair of forceps.

When indigestion is associated with an ulcerated condition of the mouth, the disorder should be treated as indicated under that heading.

GANGRENE OF THE MOUTH IN YOUNG CALVES—GANGRENOUS STOMATITIS.—This affection usually appears in young calves about the time they are cutting their teeth.

Causes.—Insufficient nourishment; debility resulting from diarrhea, and from inflammation of the navel, predisposes animals to this disease, and its development is associated with disorder of the digestive system resulting from the cutting of teeth. Adult animals have been known to be affected with the disease, but the cause is not well understood.

Symptoms.—In early stage there is redness of the mouth, from which the saliva dribbles, but in two or three days a whitish point appears on some part of the mucous membrane of the mouth. It gradually extends in size and depth, and a red, inflamed zone surrounds the affected part, which begins to present a yellowish, cheesy appearance, and then, as it begins to break up and decompose, exhales a fetid, disagreeable odor. Sometimes the entire thickness of a portion of the tissues composing the cheek become gangrenous. If decayed part is not removed with a knife, it is gradually separated from surrounding living tissue by the process of ulceration. In some cases a hole will be made through the cheek through which the saliva is ejected in process of mastication.

It may be complicated with diarrhea and consequent weakness. Malady often terminates in death, and runs its course in from seven to ten days. In adult cattle, recovery does not take place under three to four weeks.

TREATMENT.—

For the calf, give 5 to 10 grains of Quinine, according to size and age of animal, and repeat dose four times a day. If diarrhea is present, give Lime-water in ½-ounce doses. When animals show signs of debility, or diarrhea is present, Whiskey or Brandy, in 1-ounce doses, should be given three or four times a day. Mix with two or three parts of water. It may also be given when appetite is poor, two or three times a day. To cleanse the mouth and remove odor, syringe several times daily with the following solution:

Permanganate of Potash.....	2 drachms.
Water.....	1 quart.

When the gangrenous part has sloughed, then use White Lotion (page 263), and a Carbolic Acid lotion (Carbolic Acid, ½ ounce to a pint of water). Swab the raw surface several times a day to promote healing. The diet should be nutritious, and for calves the cow's milk is to be preferred. When the gangrenous tissue assumes a yellow, cheesy look, the animal's recovery will be hastened by removing the dead tissue with the knife. During the convalescent stage, give, in combination with the Quinine, Sulphate of Iron. For calves, give it in 10 to 20-grain doses, and to cows in 2-drachm doses.

CHOKING.—This is a rather common occurrence on the farm.

Causes.—From attempting to swallow too large an object, such as a turnip, potato, beet, or an apple or pear, though in rare cases it may occur from bran, chaff, or some other finely divided food lodging in and filling up a portion of the gullet. The latter form is most likely to occur in animals which are greedy feeders.

Symptoms.—Animal will stop eating, slaver at the mouth, cough, breathe heavily, and after a time become bloated in

paunch, which is noticed on left side. Will also keep chewing, poking out the nose, and swallowing, and when it drinks water it is soon ejected, and there is seen an anxious expression on the countenance. If the choke takes place in the neck region, the enlargement will be seen on the left side.

TREATMENT.—

If the obstruction is in the back part of the mouth, or upper part of throat, put a clevis in the animal's mouth, so the hand can be inserted, then while the head is held in a horizontal position by two assistants, pass the hand into the mouth and take out the offending object. An assistant to manipulate the obstruction on the outside, and push it up against you, will help in the removal. If the object cannot be reached, give carefully a swallow of melted lard, then try by manipulation on the outside, until the lard works around it, to move it downward to the stomach. If this fails, pass the probang (see "Choking," in the horse, page 105). The one-half inch hose answers very nicely—making it stiffer, if necessary, with the wire. Two assistants, by taking hold of the horns and nose, can straighten the head out nearly straight. The probang does not bother cattle in breathing as much as it does horses, and is easier to pass in cattle. Where the animal is badly bloated, and efforts to press the object down fail, tap on the left side with a trocar and canula, or even with a knife (see "Tympanites" for tapping.)

If the obstruction is very firmly lodged, use the Belladonna along with the lard, as recommended for the horse. Never use a rake-handle, or anything rigid, for a probang, as is so often done; if you do the esophagus is almost sure to be injured.

LOSING THE CUD—REMASTICATION.— It was once thought, and perhaps still supposed by some, that the ox sometimes loses his cud, and that something must be given him to take its place, and so old rags, pieces of pork, and various other substances were pushed into his throat to act as a new cud. In order that such a ridiculous practice may be discontinued by those who refer to this book, an explanation of the cud and how it is disposed of will be given

All those animals which remasticate their food, when fed, eat hastily, very imperfectly chewing the food and swallowing it in a very poorly masticated condition; food swallowed in this condition passes into the large paunch, and when this organ is opened the food in it is always found to be very coarse. After eating up its feed the animal goes and lies down and commences to chew its cud, or remasticate the food, and appears perfectly happy. In order to get the food back to the mouth a small portion of this coarse food from the paunch is thrown, by an action very much like vomiting, into the lower end of the esophagus, and this organ, by reversing its action, commences to contract at the lower end first, and forces the food back into the mouth. This portion of food constitutes the cud, or bolus. The animal now chews this very thoroughly, putting it into excellent shape for digestion; when the chewing is completed the bolus is swallowed, not stopping in the paunch, but, by a peculiar structure of the parts, passes directly into the third, and from that into the true stomach and on into the intestines, never again to return to the mouth. Almost as soon as the bolus has been swallowed, another portion of the food from the paunch is thrown into the esophagus and carried back to the mouth, constituting a new cud. The process is repeated over and over again, until the animal is satisfied; then the process of remastication is suspended for a time, to be continued again when the sense of hunger returns. Each cud is a new one. Not all the food is remasticated; some of it passes from the paunch on into the second and third stomachs without going back into the mouth. Almost any disease will cause an animal to stop chewing its cud, simply because it has lost the desire for food; when the disease is overcome and the appetite returns, the animal will again commence to remasticate without being given any artificial cud.

BLOATING—HOVEN—TYMPANITES—This disease is characterized by swelling of the left flank, and is caused by the formation of gas in the rumen, or paunch, as the result of fermenting food.

Causes.—Choking, sudden changes in food, wet clover, or eating frozen roots of any kind. Anything which will cause acute

indigestion. Very often caused by turning cattle into luxuriant pasture when not used to green feed.

Symptoms.—The abdomen is very much enlarged, and especially the left flank; by tapping with the fingers on left side over the paunch, a hollow, drum-like sound is emitted. Animal has an anxious expression of countenance, moves uneasily, and is evidently distressed. If flank is pressed in with fingers, it springs back quickly. If relief is not obtained in time, the animal breathes with difficulty, reels in walking or standing, and in a short time falls and dies from suffocation. The distension may become so great in some cases as to cause rupture of the stomach.

TREATMENT.—

In mild cases medicinal treatment may be of value, but in severe cases tapping should be resorted to at once, as the danger of the operation is very slight, and it relieves the suffering to a great extent almost immediately.

For medicines give the following:

Aromatic Spirits of Ammonia	1 ounce.
Fluid Extract of Jaborandi	4 drachms.
Fluid Extract of Calibar Bean	1 drachm.
Fluid Extract of Belladonna	1 drachm.
Hyposulphite of Soda	4 ounces.
Water, to make	1 pint.

Shake. Give as one dose, and repeat in one-half hour if necessary.

If these drugs are not at hand, give a good dose of Ginger, or an ounce of Turpentine in a pint of Oil.

A piece of fork handle held in the mouth as a bit will sometimes help in getting rid of the gas.

If the bloating continues, tap the animal. Cattle are tapped in the left flank, in the center of the triangle, or where the bloat is most prominent. Use the horse trocar and canula, as it is smaller, and yet answers every purpose. To tap, wash the instrument first in the Carbolic lotion (see OPERATIONS), and have the point of the trocar sharp; also wash place of tapping with Carbolic lotion; place the point of the trocar against the flank, direct it downwards and forwards, and push it in nearly the

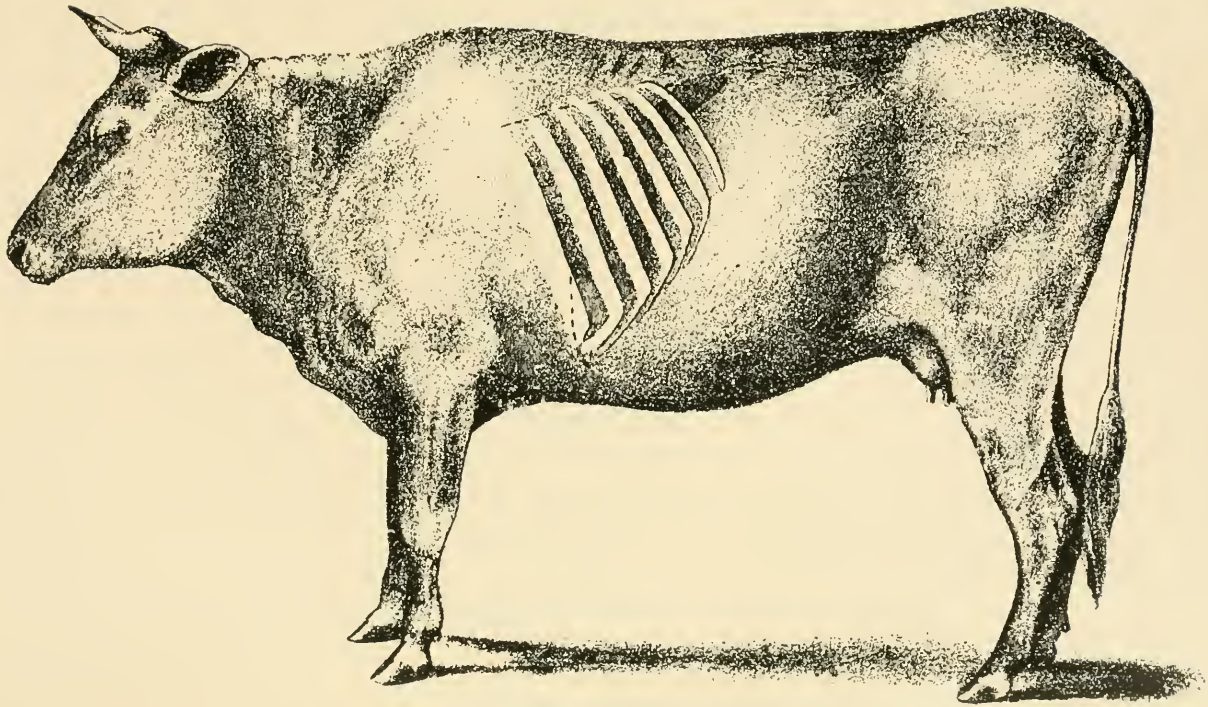
whole length; withdraw the trocar and the gas will escape. If it is necessary to tap a second time, do so in a slightly different place. In absence of a trocar and canula, a knife and a quill can be used; insert the small blade of a knife, and when it is withdrawn, put in the quill. Every stock owner should have a trocar and canula, as this disease so frequently occurs, and it generally develops so rapidly that there is no time to send for help. The gas can be removed by passing the hollow probang (see "Choking").

Even if the animal is tapped, the medicines should be used to pass the fermenting mass onward, and after the acute symptoms have passed off, give a good physic—1½ pounds of Epsom Salts, and 2 tablespoonfuls of Ginger, in 2 quarts of water. Give for a week or two the digestive tonics, as recommended under "Chronic Indigestion," and see that the cause producing the disease does not again occur.

IMPACTION OF THE RUMEN, OR PAUNCH.—This is a case where the animal's paunch is so filled with food that it causes temporary paralysis, and the whole mass lies like so much soggy material in a leather bag.

Causes.—From taking a large feed of straw, or bulky food—engorging itself; from getting loose and eating too largely of grain; or eating freely of food that animal is unaccustomed to. Getting into a grain field, or at a bin of grain, is most common cause.

Symptoms.—In some cases there is slight bloating, while in others there is no bloating at all; animal is uneasy, makes a grunt, or groan, every time it breathes. If a milch cow, the milk flow will fall off in one night. The nose will be dry; breathing and pulse will be quickened, and animal will keep getting up and down, and will not take much food or water. On pressing the flank with the closed fist the indent of the hand remains for a short time in the flank, as if the rumen were filled with a soft, doughy mass. Tapping over the stomach gives off a dull, heavy sound. Bowels are costive, and the passages are dry and slimy-looking, with a bad odor. If the animal has eaten a very large amount, the left flank will be distended; the history of the case helps diagnose.



POSITION OF THE RUMEN.

TREATMENT.—

Give a dose of physic as follows:

Epsom Salts	1½ to 2 pounds.
Bicarbonate of Soda	1 ounce.
Ginger	1 "

Dissolve in 2 quarts of lukewarm water and give as a drench.

Also give the following to assist in passing the mass along:

Aromatic Spirits of Ammonia	1 ounce.
Sulphuric Ether	½ "
Fluid Extract of Jaborandi	2 drachms.
Fluid Extract of Calibar Bean	½ drachm.
Fluid Extract of Nux Vomica	1½ drachms.
Fluid Extract of Belladonna	1 drachm.
Water to make	1 pint.

Shake. Give as one dose and repeat three or four times a day until the animal is relieved.

If there is great pain, also give 5 grains of Morphine three times a day. If the bowels do not move freely in thirty-six hours, repeat the dose of Epsom Salts, and if, after thirty-six hours longer, the mass is still unmoved, give 1 pound of Epsom Salts along with 2 to 4 drachms of Gamboge, or ½ to 1 drachm of Croton Oil; if the oil is used, give it in a pint of raw Linseed Oil. It is also good to give a quart of melted lard a day from the beginning of the attack. Give the animal all the water it wishes, but not too large an amount at one time. Give only a little sloppy food. If the medicine fails to have the desired effect, rumenotomy may be performed. This is opening the rumen through the flank and taking out the material. It requires a veterinarian. Where an animal has eaten a very large amount it might be best to have the operation performed at once, as the chances would be less than those taken by trying to get rid of the mass by the use of medicines. After the mass moves on out of the stomach, feed carefully and use the tonics as for "Chronic Indigestion," continuing their use for a week or two. If, during the course of the disease, there is bloating, give 4-ounce doses of Hyposulphite of Soda in 1 pint of water, three or four times a day, or tap (see "Tympanites").

IMPACTION OF THE MANYPLIES, OR THIRD PART OF STOMACH.—MAW-BOUND.—The omasum, or third stomach, is the stomach with a great number of leaves, arranged so as to rub constantly on one another, keeping up a grinding action on the food, as it passes between them. Sometimes this part becomes firmly packed with food, which does not pass on, and the disease is produced.

Causes.—From eating dry and over-ripe food that has little nourishment. In the spring, when cattle are turned out early, in trying to get at the new grass, they fill themselves with the old dry grass, and this lodging in the omasum, sets up an impaction of it. Is also caused by eating dry, dead grass late in the fall, or by keeping largely on straw or corn-stalks during the winter.

Symptoms.—It comes on gradually as an ordinary case of constipation, with abdominal pain, a looking around to the right side, and disinclination to move. Kicking at belly with hind feet, grunting at nearly every breath; later fever sets in, and slowly increases as the disease makes progress; there may be some tenderness in the right side, just below the ribs. The pulse becomes more rapid and at the last, weak. The colic pains and fever grow more intense; animal makes attempts to manure, but only a few hard pieces are passed; delirium and vertigo set in, and death follows if not relieved. The symptoms resemble closely those of impaction of rumen, except that the left flank is normal, and there is no bloating.

TREATMENT.—

The treatment is the same as for "Impaction of the Rumen;" use the melted lard freely; give water freely. Injections of warm, soapy water per rectum may be used as in "Impaction of the Large Intestines" in the horse (page 121). This disease cannot be relieved by an operation, as can impaction of the rumen. Upon examining the omasum after death, it is found to be filled in between the leaves with layers of very hard, dry food, and when the food is removed, the covering of the leaves comes off.

VOMITING.—This is not a very common affection in cattle, but it sometimes occurs.

Causes.—From some irritation of the first or fourth stomach; eating indigestible material, as old clothes, or a boot, or it may result from indigestion.

Symptoms.—Animals that vomit are usually in poor condition. After eating tranquilly for some time, the beast becomes suddenly uneasy, arches the back, stretches the head and neck, and suddenly ejects a greater or less amount of the contents of the rumen. In a little while after this, uneasiness subsides, and the eating is resumed as though nothing had happened.

TREATMENT.—

Give easily digested food and plenty of water. In order to allay the irritation of the stomach the following should be given:

Chloral Hydrate..... ½ ounce.
Subnitrate of Bismuth..... 3 drachms.
Thin Linseed Gruel ..... 1 pint.

Repeat dose as conditions seem to require.

If there is reason to suspect that something indigestible has been eaten and does not pass on, give the following physic:

Epsom Salts..... 1 pound.
Salt..... 2 tablespoonfuls.

Mix in a quart of lukewarm water and give as a drench.

Also give the stimulating mixture as is recommended for "Impaction of the Rumen," repeating two or three times a day for two or three days, and then give the tonics as for "Chronic Indigestion."

SUB-ACUTE INDIGESTION—OFF-FEED.—This is a disease in which the digestive function is more or less imperfect.

Causes.—The condition is most often caused by high feeding, especially with grain. Quite frequently seen in fattening animals, and also in dairy cows. Poor food may also cause the condition.

Symptoms.—The first thing noticed, the animal leaves a part or all of its grain, and takes but little coarse feed; animal also shows some dullness; after a day or two bowels are sluggish. The symptoms resemble, somewhat, impaction of the rumen, but are milder. If not relieved, the more severe symptoms of impaction may present themselves.

TREATMENT.—

As soon as an animal is seen to leave a part of its grain, cut down the feed at once, or let them go without for a feed or two. Give a dose of Epsom salts—1½ pounds—and an ounce or two of Ginger, in 2 quarts of water; also use the following:

Fluid Extract Nux Vomica	1½ drachms.
Fluid Extract Jaborandi	3 drachms.
Fluid Extract Calibar Bean	1 drachm.
Aromatic Spirits Ammonia	1 ounce.
Water, to make	1 pint.

Shake. Give as one dose, and repeat three or four times a day, until animal is eating again.

Give a little sloppy diet if he will eat. After commencing to eat be careful about overfeeding again, and give the tonics as for "Chronic Indigestion" for two or three weeks.

CHRONIC INDIGESTION.—This is a condition in which the digestive organs are only partly performing their function, the condition having existed for some time.

Causes.—The cause is generally due to poor feed, or to too long continued high feed. Cattle are not so subject to the disease as horses, yet it is not infrequent.

Symptoms.—The animal is unthrifty, is not doing well, hair is harsh, skin harsh and dry; animal is dull; the appetite may remain good, or be capricious, one day eating well, another day eating but little; increase of feed produces little or no improvement in the animal's condition; if a cow, milk secretion is small. The feces are dry and hard.

TREATMENT.—

Give the animal the best of feed, roots, or silage, if possible, along with clover hay and bran, oats and corn, and a little Linseed

meal. If bowels are costive, give a 1-pound dose of Epsom Salts, repeating once a week; also use the following tonics:

Gentian	½ pound.
Bicarbonate of Soda	½ "
Nux Vomica	¼ "
Arsenic	1 drachm.

Mix. Dose: Tablespoonful morning and night in moistened grain.

At noon give a tablespoonful of the following:

Sulphate of Iron	4 ounces.
Saltpeter	4 "

Mix.

Or the following iron mixture may be used:

Liquid Chloride of Iron	2 ounces.
Nitro-hydochloric Acid	2 "
Water to make	1 pint.

Shake. *Dose:* 1 ounce, diluted in 8 ounces of water.

HAIR, OR BINDER TWINE BALLS, OR CONCRETIONS.—These may be found in rumen or paunch, or in the reticulum or second stomach. In calves, foreign substances are sometimes found in the fourth stomach.

Causes.—Hair balls are caused by animals licking each other in spring, when the hair is loose, and this hair collects in a ball in the stomach. In the case of binder twine, the cattle get the twine from eating straw which has been bound with twine, and this collects and forms into balls.

Symptoms.—The symptoms of these foreign bodies are not at all characteristic; if in the first or second stomach they produce but little trouble, the animal acting normal; when in the fourth stomach, substances are apt to cause more irritation, and produce symptoms similar to inflammation of the stomach, or impaction. Upon opening the stomach of cattle which have been slaughtered for meat, foreign bodies of various kinds are frequently found, having produced no apparent disturbance.

TREATMENT.—

Inasmuch as the exact condition can not be recognized, symptoms only can be treated; if they are like those of inflammation of the stomach, treat as for that; if there is impaction, treat that. If there is good reason to believe that there is something in the rumen, rumenotomy could be performed. See "Impaction of Rumen."

INFLAMMATION OF THE ABOMASUM, OR FOURTH PART OF THE STOMACH.—This disease is more common in calves than in older cattle.

Causes.—It is caused by eating frozen roots, or grass, and also by eating over-ripe food. In calves it is caused from changing too suddenly from sweet to sour milk; in the case of young calves, especially, this change irritates the stomach and sets up disease.

Symptoms.—First there is diarrhea, then constipation, changing from one to the other every day or two; animal breathes quickly and groans with pain; nose is hot and dry; belly has a tucked up look and is sore to pressure; the legs and ears are cold. The pulse is rapid and hard, the temperature elevated; animal refuses all feed.

TREATMENT.—

To calves give the following drench:

Raw Linseed Oil	¼ pint.
Fluid Extract of Belladonna	10 drops.
Laudanum	1 drachm.

Mix and give as a drench.

Give the belly a good rubbing with Mustard and vinegar; blanket to keep warm, and place some hot salt in a bag over the back, and after this give a teaspoonful of Laudanum and 10 drops of Fluid Extract of Belladonna in ½ cup of milk three or four times a day, until it gets relief; 1 drachm of Subnitrate of Bismuth, divided into three powders, and one given in a little thin gruel three times a day is also good. If it will drink, give it small quantities of new milk, and every time it is fed, put a teaspoonful of baking soda in the milk.

To old cattle give the following:

Raw Linseed Oil..... 1 pint.
Fluid Extract of Belladonna..... 1 drachm.
Laudanum..... 1 ounce.
Mix and give as a drench.

Afterward give the following:

Laudanum..... 1 ounce.
Fluid Extract of Belladonna..... 1 drachm.
Fluid Extract of Aconite Root..... 15 drops;
Mix in a pint of water and give as a drench three times a day until relieved.

Subnitrate of Bismuth in 2-drachm doses, in a little thin gruel, three times a day, is also good. Clothe the body well and put hot salt in a bag to the back. Feed soft food and give lukewarm water to drink.

DIARRHEA, OR SCOURS. — Diarrhea results either from increased action of the muscular coat of the intestines, or an increased secretion of the juices, or from both of those conditions combined.

Causes.—Food taken in excess, or of improper quality; excessive secretions, especially bile; impure water, and water drunk in excess; mechanical congestion of the intestinal vessels; acute or chronic inflammation of the bowels; sudden change in feed. Exposure to changes of temperature, either of heat or cold, may produce it. May be a symptom of other diseases.

Symptoms.—In severe cases, the animal is dull, places its feet well under its body, arches its back, and shows thirst. Passages from the bowels are frequent, at first consisting of thin dung, but as disease advances they become watery and offensive smelling, and may even be streaked with blood. Frequently the malady is accompanied by fever, great depression, loss of strength, rapid loss of flesh, and it may terminate in death. Mild cases simply show a too fluid condition of the droppings.

TREATMENT.—

When the disease is from irritating properties of food, give a mild purgative, as a pint of either Linseed or Castor Oil.

And also give the following:

Laudanum..... 1½ ounces.
Bicarbonate of Soda..... 1 ounce.
Water..... 1 pint.

Shake. Give as one dose; repeat three or four times a day until condition stops.

Alternate with the above, in bad cases:

Copperas..... ½ ounce.
Water..... 1 pint.

Shake. Give as one dose, and repeat three times a day.

If these fail to check, use the following:

Corrosive Sublimate..... 7 grains.
Water..... 1 pint.

Shake. *Dose:* ½ to 1 ounce, repeated three or four times a day.

This is very poisonous, and care should be taken to use it as directed.

Give dry feed, limit the water, giving Linseed meal, starch, or flour gruel. If the animal will eat, give dry, burned flour. The doses given are for the adult; give calves about $\frac{1}{10}$ the dose. See "White Scours" for the disease in calves. If there is great prostration, blood in passages, and pain, see "Dysentery." When the condition is a symptom of some other disease, that disease must also be treated.

DYSENTERY—BLOODY FLUX.—Dysentery begins with inflammation of the mucous membrane of the colon, but may extend until all the bowels are involved.

Causes.—Feeding musty hay and grain, or other forage in like condition; acid, poisonous plants; bad water; sequel of neglected diarrhea; or following almost any debilitating disease.

Symptoms.—Animal eats slowly, ruminates less frequently, and walks slowly. There are sometimes colic pains. As disease advances, animal ceases to eat and chew the cud, the muzzle is dry, eyes sunken, coat rough, and the skin dry and hide-bound; stands with the back arched. At first, bowels act irregularly,

passages are thin, then become fetid, and are streaked with blood; pulse rapid and weak, temperature elevated. Disease may or may not run a rapid course, and, when fatal, the lining of the bowels will be found thickened and reddened at some points, showing ulceration at others, and on some portions of its surface covered with a layer of mucus. There is more or less mucus passed along with the droppings during the course of the disease, giving them a slimy appearance.

TREATMENT.—

The disease is treated much the same as "Diarrhea," starting in with the Oil; also use the Laudanum, but the astringents more especially are needed in this disease; use the Copperas solution part of the time and part of the time, in its place, use the following:

Acetate of Lead..... 1 drachm.
Water..... 1 pint.

Shake. Give as one dose, and repeat two or three times a day.

The Corrosive Sublimate solution can also be used, as with "Diarrhea." Also use the gruels and burned flour. Blood flour is also excellent for this trouble; give an adult animal from 2 to 4 tablespoonfuls in a pint of warm water.

With this disorder also use the following as a stimulant, and also to allay the fever:

Fluid Extract of Aconite.....1½ drachms.
Fluid Extract of Belladonna..... 1 ounce.
Alcohol..... 5 ounces.
Saltpeter ..... 2 ounces.
Water to make..... 1 pint.

Shake. *Dose:* 2 ounces, three or four times a day, in ½ pint of water.

If necessary to continue for more than two or three days, leave the Aconite out of the prescription, and put ½ ounce of Fluid Extract of Digitalis into the prescription in its place.

After recovery, use for a couple of weeks the tonics as for "Chronic Indigestion."

COLIC.—

Causes.—From drinking copiously of cold water, which produces cramps of stomach and bowels; or from a change of food, especially if green or frozen. Not as common a disease with cattle as with horses.

Symptoms.—There is some distension of the abdomen, but no accumulation of gas. As distension and pain occur immediately after drinking, there can be no question as to cause. The animal is uneasy; lies down and gets up; stretches out and strikes the feet against the belly; moans, and looks around at the side, showing distress.

TREATMENT.—

Walk the animal about for ten minutes. In some cases the walking exercise will result in a diarrhea, which will bring about a cure for the disorder. In case the pain persists, give the following:

Sulphuric Ether	1 ounce.
Laudanum	1 "
Warm water	1 pint.

Give as one dose, and repeat in an hour if not relieved, and again in two hours if necessary.

In an emergency, when the medicine is not to be had, give 4 ounces of Whiskey mixed with a pint of warm water, or a tablespoonful of Ginger may be given in the same way as the remedies already mentioned. Do not exercise beyond a walk. Give one of the colic mixtures as recommended for the horse under "Colic" (page 115). Hot applications to the loins or abdomen, if possible, will be of great value.

DEPRAVED APPETITE—PICA.—Cattle suffering from this disease have a capricious and variable appetite as regards their ordinary food, but show a strong liking to lick and eat substances that healthy cattle show no inclination for, such as lime, earth, coal, gravel, or even the dung of other cattle.

Causes.—Bad food, especially food that has undergone changes, which lessens its digestibility and nutritive qualities, is

a common cause. Cattle pastured on low, swampy land are predisposed to it. It occasionally happens that one individual suffers, though all are fed alike; in such case the trouble must arise from a lack of assimilation.

Symptoms.—In addition to licking and eating strange things as above noted, animals affected with this ailment fall off in condition, their coats become staring, the gait slow.

TREATMENT.—

Give treatment as for "Chronic Indigestion."

INFLAMMATION OF THE BOWELS—ENTERITIS.—This is an inflammation of the lining and also the muscular wall of the bowels, and is quite different from the inflammatory stage of dysentery.

Causes.—From eating various poisonous substances, either animal, vegetable, or mineral; it may follow a too sudden checking of the diarrhea; drinking of ice-cold water may produce it; or exposure to a cold, damp wind, or any influence that suddenly chills the surface of the body may act as a cause.

Symptoms.—There is constipation, such feces as are passed being hard, dry, and mucus coated, and sometimes offensive and bloody; high fever with quick, hard pulse; dry mouth, with fur over tongue and cheeks; great thirst; appetite fails, and in cows, the milk; rumination is stopped; colic pains may occur, although pain is more apt to be constant; more or less pain is produced by pressing against the right flank; breathing is labored, and more or less bloating may be noticed; urine is scanty and high colored; back is arched, animal moans, grinds his teeth, and refuses to move; pulse gradually becomes imperceptible, and extremities are cold; and in fatal cases, death follows in a day or two. The high temperature and rapid, hard pulse helps distinguish this from the other diseases of the digestive organs.

TREATMENT.—

If the inflammation is caused by irritating poisons, either vegetable or mineral, give thin Linseed gruel freely; and from whatever cause, a liberal amount of the gruel is good; it helps to unload the bowels without irritating them. Give water in small

quantities very frequently. Give 1-ounce doses of laudanum five to seven times a day, and also the following :

Fluid Extract Belladonna	1 ounce.
Fluid Extract Aconite	1½ drachms.
Saltpeter	2 ounces.
Liquor Ammonia Acetatis	8 ounces.
Water to make	1 pint.

Shake. *Dose:* 2 ounces, four times a day in a half pint of water.

The Ammonia Acetate solution may be left out if not at hand.

Apply hot blankets to the loins and right flank ; apply as hot as the animal will stand, and change every half hour. If the weather will not permit of using hot water, rub on a little Turpentine liniment or Mustard plaster and apply hot salt bag. If animal recovers, feed carefully for some time, and give half doses of tonics as for "Chronic Indigestion."

INFLAMMATION OF THE LINING OF THE BELLY CAVITY—PERITONITIS.—This is an inflammation of the membrane lining the cavity of the belly, and covering the bowels and other abdominal viscera.

Causes.—From standing in a cold rain, or wind, after being warmed up and sweating; or from being wet and afterward lying out on the cold ground. It may also be caused by wounds penetrating the abdomen. Sometimes follows castration or spaying; sometimes follows parturition.

Symptoms.—Continuous or occasional shivering; animal lies down, but acts uneasy; often turns the head toward the flanks and lows plaintively; pressure on flanks produces pain; no appetite; muzzle dry, and no rumination; while standing, legs are placed well under body; pulse small and hard; temperature elevated; dung small and hard. If disease is complicated with inflammation of the bowels, pain is more severe and animal more restless. The skin is cold and dry in early stage, but when more advanced, this condition may be succeeded by heat of skin and quick breathing. The fits of trembling, uneasiness, small and hard pulse, elevated temperature, and tension of left flank with pain upon pressure, are symptoms the presence of which are

indicative of the disease. Symptoms are very much like inflammation of the bowels, only not quite so severe, and disease runs a slower course. If from wounds, the presence of these help to diagnose.

TREATMENT.—

When from injury by the horn of another animal being thrust through the abdominal walls, or when resulting from castration, give special treatment, as indicated under the title of injury, and follow general treatment as here given:

The body should be warmly clothed, and it is advisable when practicable, to have a blanket, which has been wrung out in hot water, placed over the abdomen, then covered with several dry blankets, which are kept in place by straps or ropes passed around the body. If the animal is lying down the straps are not necessary. The wet blanket must be changed as often as it cools (every half hour), the object being to draw the blood to the surface of the body, and relieve internal parts. If for any reason the wet blanket had best not be used, as in a cold stable, apply Turpentine liniment or Mustard paste to the abdomen, and put hot salt bags under the woolen blankets.

Internally, use the same treatment as recommended under "Inflammation of the Bowels," the disease first preceding this, for the first two or three days, then change the prescription and give the following:

Fluid Extract of Belladonna.....	1 ounce.
Fluid Extract of Digitalis.....	6 drachms.
Iodide of Potash.....	6 "
Saltpeter.....	3 ounces.
Water to make.....	1 pint.

Shake. *Dose*: 2 ounces, three times a day.

If a large amount of fluid should collect in the abdominal cavity, treat as recommended under the next disease.

DROPSY OF THE BELLY—ASCITES.—In this disease there is a watery effusion into the cavity of the abdomen.

Causes.—From peritonitis, or acute, or chronic diseases of the liver. Also from a run-down condition, resulting from poor feed.

Symptoms.—A gradual increase in the size of the belly at its lower part, while the flanks become hollow; pallor of the mucous membrane of the mouth and eye; weak, sluggish gait; want of appetite, and irregularity of ruminating. On percussion, or tapping of the surface of the abdomen with the fingers, a dull sound is produced. If hand and arm are oiled and passed into the rectum as far as possible, on moving hand from side to side, the fluctuation caused by the presence of fluid in the abdomen may be felt. The fluctuation may also sometimes be felt by pressing in suddenly in the lower part of the right flank.

TREATMENT.—

Give nutritious food, and use the Gentian and Nux Vomica tonic, as recommended under "Chronic Indigestion," along with the last preparation as given under "Peritonitis." But give the tonic in thin gruel, so as not to throw the animal off its feed. If the bowels are sluggish, give ½-pound doses of Epsom Salts every three or four days. If this treatment fails to reduce the amount of fluid, the abdomen will have to be tapped. This is done the same as for Tympanites (see that disease), except that the trocar and canula is introduced a few inches back of the navel, on the underside of the abdomen. Push the instrument in only far enough to go through the wall, withdraw the trocar and the fluid will flow out through the canula. Continue the internal treatment after tapping.

CONSTIPATION.—This is a condition which exists when there is not sufficient moisture in the stomach and bowels, and the feces are passed tardily and in hard, dry lumps.

Causes.—From the too free use of dry, over-ripe feed; from insufficient or impure water; from too little exercise. It is often symptomatic of other disease, especially that of the liver. Calves sometimes suffer from constipation immediately after birth.

Symptoms.—It is recognized by the hard, dry manure, which is also sometimes glazed. Animal may not care to eat or drink, and the muzzle is dry. It is apt to run into inflammation of the bowels, colic or impaction if not overcome. If a symptom of other disease, the symptoms of that disease will be present.

TREATMENT.—

Give the same internal treatment as recommended under "Sub-Acute Indigestion; Off-Feed." Also give laxative food, and plenty of pure water to drink. If a mild case, laxative food, with a handful of salt and plenty of water may be all that is required. Injections into the rectum of warm water and soap are of much benefit in aiding either laxatives or purgatives. When a symptom of a disease, treat as indicated under the affection.

In the case of calves suffering from constipation immediately following birth, give an ounce or two of Castor Oil shaken up in an ounce of new milk. The dam's milk is the best preventive of this trouble, as it contains laxative substances which help in unloading the bowels. Inject a little warm, soapy water into the rectum. If the oil fails, give 1 or 2 ounces of Epsom Salts in 4 ounces of warm water, and also a little of the mixture as recommended above.

INTESTINAL WORMS IN CATTLE.—Cattle are less infested with worms than any other species of domestic ainmals, and it is rarely necessary to apply treatment for the removal of these parasites. Tapeworms and round worms are, however, sometimes found in the intestines of cattle. Tapeworms more often than the round ones.

Symptoms.—An examination of the manure is the only certain method of making sure that there are worms in the bowels, and if present the worms will be found to some extent in the droppings. In some cases the animal may fall off in condition, though the appetite may be very good.

TREATMENT.—

For tapeworms, feed lightly for a day or two and then give ½ ounce of Oil of Male Fern twice a day in a pint of milk for three days in succession, and follow the last dose with 1½ pounds of Epsom Salts.

For round worms give 2 drachms of Sulphate of Iron, three times a day, mixed in moistened grain, and after three days' treatment with this, give the Epsom Salts as above. Oil of Turpentine may be given in doses of 1 ounce with a pint of milk or

raw Linseed Oil, or Santonin in 1-drachm doses in feed, to be followed by the purgative as described. In treating calves, which are more apt to be infested with worms than older cattle, give from one-quarter to one-half the dose given above.

WOUNDS OF THE ABDOMEN.—A wound of the abdomen may merely penetrate the skin, but as such cases are not attended with much danger, the purpose of this article will be to consider more especially those wounds which penetrate the entire thickness of the walls, and expose, to a greater or less extent, the organs contained.

Causes.—By falling on sharp objects that penetrate; by a blow from the horn of another animal; incautious use of caustics in treating hernia.

Symptoms.—When the wound is small, at first the bowel exposed looks like a small round tumor, but in a few minutes a loop of intestines may emerge from the opening. Animal will then show symptoms of severe pain, by pawing with his feet, which will accelerate the passage of new loops of the intestines, so that they may in some cases reach the ground. The pain now is so great that the animal becomes almost frantic.

TREATMENT.—

In case the bowels are torn and bruised, there is nothing to do but to slaughter the animal at once. If the parts have not been lacerated, the bowels should be cleaned by pouring tepid water over them and then Carbolic Acid lotion, as in cleaning the vagina in eversion of that organ. After cleaning the bowel, return it, wash the edges of the wound with water and the Carbolic Acid lotion, sew up the muscles with catgut, the skin with silk (see OPERATIONS, page 347). Apply bandage as with "Hernias." Dress the wound daily with the Carbolic Acid lotion. (See "General Treatment of Wounds," HORSE DEPARTMENT). If only the skin is torn, treat as under same heading.

RUPTURE, OR HERNIA

A hernia is a displacement of some of the abdominal organs, generally a portion of the bowels, outside the abdominal cavity; they are named according to their location.

VENTRAL HERNIA is an escape of some one of the abdominal organs through a rupture in the abdominal muscles, the skin remaining intact. The small intestine, or part of the large intestine, are the parts which usually form a ventral hernia.

Causes.—Hernia is frequently produced by blows of the horns of other animals, by kicks, and by falls. In the case of old cows this may occur without any direct injury. In advanced stages of pregnancy, the increase of the size of the abdomen causes a thinning and stretching of the muscular fibers, which at last may rupture or give way.

Symptoms.—The hernia is most often situated at the right side of the abdomen, producing an enlargement of greater or less size. The swelling is not usually painful, is of a doughy appearance, or elastic, according as the intestines does or does not contain feces. By working with the hand, the bowel can be pushed back and the enlargement reduced, and the rent in the abdominal wall felt. If on the upper and right side, the hernia is usually formed by the small intestine. It is not so readily reduced, but when once done is not as likely to be reproduced as in those occurring lower. Adhesion to the abdominal wall, and strangulation are complications which sometimes take place. In adhesion the rupture cannot be reduced by pressure, and when strangulation exists there is pain. In the latter case, the edges of the opening press on the bowel, so as to stop the passage of the feces, produce inflammation, and finally gangrene. The strangulated hernia will cause severe abdominal pain, shown by uneasiness, kicking belly, etc.

TREATMENT.—

When a hernia can be put back into the abdomen (reduced), it should be kept there to allow the walls of the wound to grow together. This may be done in a number of ways.

The following method of applying a bandage has been recommended by some. Prepare a bandage of strong material about 10 yards long and 3 to 4 inches broad, and a flexible but solid piece of pasteboard adapted to the size of the hernia. Push back protruding organ into the abdomen; this being done, a layer of melted pitch and turpentine is quickly spread on skin covering seat of hernia and extending somewhat beyond. Cover this adhesive layer with a layer of fine tow, then put a new layer of pitch and turpentine on the tow, and lay on this the pasteboard, the outer surface of which cover with the same preparation; lastly, the bandage, adhering to the piece of pasteboard, to the skin, and to the different turns which it makes around the body, is carefully applied so as to form an immovable, rigid, and solid bandage, which retains the hernia long enough for the wound in the abdominal walls to heal permanently. Bandages get loose as the animal changes slightly in size from day to day, and so must be watched.

Resorting to surgery for the curing of ventral hernia is advisible, if the rupture is not too large. The skin is cut through over the rupture and the muscles sewed up with cat-gut and then the skin sewed up with silk. A bandage is then put around the animal to help support the stitches; see OPERATIONS, in HORSE DEPARTMENT, for general principles for operations. Large hernias best not be operated on in this way—a rent over six or eight inches long. Ruptures on the under side of abdomen are more apt to recur when they have been returned, and wounds made in operating on them are more difficult to heal than when hernia is on the side. When a rupture is strangulated—circulation of contents of sac stopped—it is advisible to open the sac carefully and return the parts, enlarging the opening in the abdominal muscles enough to return protuding organs, after which close the wound in the muscles with cat-gut stitches, and then the wound in the skin with silk thread. Put over this a compress of ten to twelve folds of cloth; and apply a bandage around the body to hold it in place, fastening the two ends at the back. A ventral hernia may also be treated by ligating the fold of skin, or by the use of the elastic bandage as with umbilical hernia.

UMBILICAL, OR NAVEL HERNIA.—The umbilicus, or navel, is the opening in the floor of the abdomen through which the blood vessels pass from the fœtus to enter the umbilical cord; naturally this closes after birth. Sometimes this remains open in new-born calves, and allows a part of the bowel to slip through the opening, constituting what is called umbilical hernia, or rupture.

Causes.—In a new-born animal, in which the accident occurs, the opening is too large, or does not close as it should, and a portion of the intestine passes through it. May be caused by roughly pulling away the cord; by kicks, or blows, on belly; by any severe straining which affects the navel.

Symptoms.—There is an enlargement at the navel, and by laying the animal on his back, and working it with the hand, the bowel can be pushed back and the opening felt.

TREATMENT.—

It is well to bear in mind that many of the smaller ruptures will heal of themselves—nature effects the cure. As animal grows older, the muscles on the sides of the opening get stronger and resist pressure, bowels grow larger, and do not so easily pass through opening, so that from a combination of causes there is a gradual closing of the navel. When there is no evidence of self-closing, the calf should be laid on its back, and if rupture does not return into belly, the reduction may be brought about by gentle handling. When this is done, clip the hair from around the parts, and apply a compress of ten to twelve yards of linen, or cotton, bandaging as directed in ventral hernia. Or, use a bandage having in it some elastic webbing; this keeps the bandage tight, regardless of the movements of the animal. In case there is adhesion, so that the intestines cannot be put back, the skin must be laid open with a knife in the long direction, and adhesions carefully separated, and after the protruding parts have been put back, the sides of the umbilicus freshened by cutting, and then edges of wound brought together with catgut stitches and the wound in the skin sewed with silk. Bandage with a plain, or elastic, bandage, and dress wound daily. See principles for, in OPERATIONS, HORSE DEPARTMENT. Another plan is to cord the

pendulous portion of the skin—after returning the intestines, gather up the loose skin and tie a string around it, close to the body; tie tight enough so it will not slip off. This will likely slacken in a few days, when a new piece should be applied, just above the first one. This sets up inflammation and causes the edges to adhere, and by the time the skin below the tie has lost its vitality and dropped off, the umbilicus is closed and there is no danger of the bowel coming down. Sometimes adhesion does not take place, the skin sloughs, and the last state is worse than the first; this is due to tying the string too tight and sloughing too quickly, or to the edges of the umbilicus being so healed over that they will not unite, which might be the case if the hernia has been present for some time. With these old hernias the best treatment is to cut in, raw the edges and sew up, and then use the compress and bandage.

INGUINAL HERNIA.—Inguinal hernia is caused by a loop of the intestine passing down into the inguinal canal—the canal leading from the abdomen down into the scrotum, in which lies the spermatic cord. This accident is more apt to occur in bulls, although it may happen in steers. It rarely occurs. The bowel becomes strangulated, and the condition is only recognized when this occurs, and then the following symptoms are presented. The animal becomes restless, stamps with his feet, lies down and gets up, kicks at his belly, looks at his flank, etc. With these symptoms an examination should be made through the rectum. Pass the hand into the rectum and feel along the front border of the pelvic floor, and if the condition exists, the bowel can be felt entering the canal a little to one side of the center and just in front of the pelvic border; the swollen condition of the bowel will help recognize it.

TREATMENT.—

Place the animal with the hind feet higher than the front, and remove the bowel from the canal by pulling upon it. After removing the bowel, if a steer, and ready for the market, dispose of him, or fat as soon as possible, as accident may re-occur. If a bull, and it re-occurs, castrate as for scrotal hernia.

SCROTAL HERNIA.—This is a hernia in which the bowel passes down through the inguinal canal into the scrotum. With male calves the condition is sometimes present at birth, and later on gradually reduces itself by the canal closing and crowding the bowel out; or, the condition may continue, the canal being large enough to allow the feces to pass through the loop of the bowel without being obstructed, or it may become strangulated and cause serious trouble.

Symptoms.—The scrotum is larger than it should be, especially on one side ; by feeling of it, it is found to contain a mass under the testicle, and by laying the animal on his back the bowel can be worked back into the abdomen. The condition may exist for a long time and cause no apparent inconvenience, or the bowel may become strangulated at any time and cause symptoms as with inguinal hernia.

TREATMENT.—

Castrate the animal by the covered operation, the same as recommended for the colt or pig affected with this trouble.

DISEASES OF THE HEART AND BLOOD VESSELS.

INFLAMMATION OF THE PERICARDIUM—PERICARDITIS.—This is an inflammation of the sac or membrane enclosing the heart, and it is often associated with pneumonia, pleurisy, rheumatism, and other constitutional diseases. It also occurs as an independent affection, due to causes similar to those of other diseases of the chest, such as cold, or dampness, and changes of the weather.

Symptoms.—It may be ushered in by a chill, followed by fever of more or less severity; the animal stands still and dull, with hanging head and an anxious expression. Pulse may be large, perhaps hard; there is also a venous pulse. Hand against chest will feel beating of heart, which is irregular, sometimes

violent, then again weak. Legs are cold; breathing quickened, and usually abdominal; tapping or striking left side of chest gives pain. There may be a line or furrow along line of the false ribs from below and behind elbow back to flank. Spasms of the muscles may occur in region of breast, neck, or hind legs. After a time, which is varying in length, legs may swell, and swelling may appear under chest and brisket. In first stages, the ear applied to chest will hear a to-and-fro friction sound, corresponding to the beats of heart; when exudation into heart sac takes place the sound is not heard, and will not be until fluid is absorbed sufficiently to allow surfaces to come together again. A murmuring sound like that made by bellows sometimes takes place of friction sound, which indicates that the endocardium, or heart lining, is also involved. The friction sound in pleurisy is heard in consonance with breathing, so there is no need in confusing the symptoms, if one is careful.

TREATMENT.—

When this disease is associated with other diseases, these must be treated as directed in description of them. Keep animal in a quiet, comfortable place, free from excitement. Clothe body warmly and hand-rub the legs until circulation is re-established, and then snugly bandage. Give nutritious food in moderate amount. At the beginning, give a mild purgative of 1 to 1½ pounds of Epsom Salts, dissolved in a quart of warm water. Otherwise give the same treatment as recommended for this disease in the horse, remembering that the dose for cattle is one and one-half to two times the dose for the horse (see page 234).

INFLAMMATION OF VEINS—PHLEBITIS.—

Causes.—From bleeding without proper care, or with unclean fleam or lancet; by animal rubbing the wound against some object.

Symptoms.—When inflammation follows the operation, the coats of the veins become enlarged, so much so that the vessel may be felt, hard and knotted beneath the skin, and when pressed on, pain is shown. A thin, watery discharge, blood tinged, issues from wound. When pin is taken out it is seen that wound has

not healed ; the blood becomes coagulated in the vessel, and in inflammation of the jugular, the coagulation extends from wound upward to first large branch. Abscesses may form along vein. The inflammation is followed by obliteration of that part of vein in which coagulation exists. This is of small import, as cattle have an accessory jugular vein which gradually enlarges and thus fits itself for increased amount of blood it must carry.

TREATMENT.—

The treatment for inflammation of the vein is the same in cattle as in horses (see page 239). As bleeding is very rarely practiced now, this condition is not so frequently seen as formerly, when animals were bled for nearly everything.

DISEASES OF THE LIVER AND SPLEEN.

YELLOWS, OR JAUNDICE; CONGESTION OF THE LIVER.—

Causes.—Congestion, or inflammation of the liver; from bile stones forming in the duct of the liver, obstructing the flow of bile. It is most common in stall-fed cattle.

Symptoms.—Pressure along the margin of the short ribs on the right side produces pain; appetite is poor, and animal shows hardly any inclination to drink; mucous membranes of the mouth and eyes are yellow, the urine has a yellow or brown appearance, and animal lies down much, and moves with great reluctance, moans occasionally, and has a staggering gait. The horns and ears are cold; in cows the secretion of milk is much diminished, and that which is secreted has a bitter taste; sometimes the animal has a dry, painful cough, and presents a dull, stupified appearance.

TREATMENT.—

To produce a free action of the bowels, and remove the usually congested condition of the portal vein and liver, give 1½

pounds of Epsom Salts, dissolved in water, and after the effect has worked off, give 4 ounces of Glaubers Salts each day; aside from this give the treatment as for the horse, remembering that the dose is one and one-half to two times as large for cattle as for the horse (see page 131).

INFLAMMATION OF THE LIVER—HEPATITIS.—This is a more advanced stage of congestion of the liver. It is frequently restricted to a special part of the liver and the rest of the organ may be comparatively healthy. The gland cells are the seat of inflammation, and abscess formation is the result.

Symptoms.—The symptoms are sometimes obscure, and their real significance is frequently overlooked. The most prominent symptoms are yellowness of the white of the eye, and membrane lining the mouth; the appetite is poor; the body presents an emaciated appearance, but there is frequently fullness at the lower part of the abdomen. The gait is weak, and animal lies down more than usual, and while doing so often has the head turned around resting on the side of the chest.

TREATMENT.—

Give:

Sulphate of Soda	½ pound.
Taraxacum	½ ounce.
Tepid water	2 quarts.

Mix, and give as one dose. Repeat this night and morning until a relaxed condition of the bowels is produced.

The object is not a strong purgation, but a laxative effect, which should be continued several days. After treatment has been continued for several days, give the following:

Quinine	1 drachm.
Nitro-muriatic Acid	1 drachm.

Shake up in a quart of cold water.

This dose should be given three times a day until the animal has regained his strength.

Rub Turpentine liniment well in, once a day over the region of the liver, on the right side. Extreme heat, and pasturing animals on low-lying ground, are conditions favorable to the production of this disease.

FLUKE DISEASE IN CATTLE—WORM IN THE LIVER.—This occurs in cattle and sheep pasturing on low-lying lands, and is more often met with in rainy seasons. Not met with except in a few localities in this country.

Cause.—Is a parasite, called the fluke, or Fasciola Hepatica, which infests the biliary ducts of the liver. The immature forms are taken up in the drinking water, or in grazing, in this way passing to the stomach, and, changing their forms, finally find lodgment in the liver. When the full development stage is reached, the fluke passes out in the excreta, and its eggs, by the agency of moisture, hatch, and the young fluke passes through a number of changes before it infests other cattle.

Symptoms.—Upon first entering the liver, when the flukes are small, they seem to stimulate its action and the animal seemingly thrives better than ever; but when the flukes attain their growth and are present in large numbers, they set up an inflammation of the organ. The liver becomes soft and very easily broken down. Animal becomes dull and weak; swellings form under the throat. Mucous membranes become yellow, skin harsh and dry. Fever, with great emaciation and dropsical accumulations in the chest and belly, follow, which is soon in turn followed by death. Upon post-mortem the parasites are found in the liver; small, flat worms.

TREATMENT.—

Is of no avail. Affected animal should be killed at once, and unaffected cattle should be moved to a higher and dryer pasture. Horses are unaffected with this disease, and can be put into a lot where cattle have been attacked.

DISEASE OF THE SPLEEN.—While the spleen is sometimes affected with disease, aside from those conditions of it, which are the result of other disorders, yet the symptoms which the animal presents are so uncharacteristic that it is almost, if not quite, impossible to diagnose disorders of the organ during life. About all that can be done is to treat symptoms, in cases of this kind, where a diagnosis cannot be made. Laxatives, tonics, and fever mixtures are generally in order.

DISEASES OF THE URINARY ORGANS

INFLAMMATION OF THE KIDNEYS—NEPHRITIS.—

Causes.—External violence, wounds, strains, etc.; eating acrid, diuretic plants; and too free use of diuretic medicines.

Symptoms.—It is rather rare in cattle. When it occurs, there are colicky pains, with great uneasiness; the urine is thick and dark colored, and voided often and in small quantities, and with much straining and pain; there is tenderness over the loins, especially at the sides immediately below the transverse spines of the lumbar vertebrae; the gait is straddling, and lameness is noticeable, sometimes in one leg and sometimes in both; the appetite is poor; fever runs high; rumination ceases; the back is arched when standing; sometimes blood, and in the later stages pus, is evacuated with the urine; nose becomes hot and dry, horns and extremities cold, and breathing labored. Diarrhea often sets in and sometimes dysentery; this state being often followed by constipation. At the last there is profuse sweating, great pain; the pulse becomes small and weak; and stupor and death follows.

TREATMENT.—

First, remove the causes as far as possible. Give a fairly brisk purgative—from 1 to 1¼ pounds of Epsom Salts and a quart of melted lard. Aside from this give the same treatment, omitting the laxative, as recommended for the horse (page 132), giving from one and one-half to two times the dose. Apply the hot blankets to the loins and also the Mustard plaster. The chronic form of the disease is rarely met with in cattle, but in case it should exist, treat as for the horse.

DIABETES INSIPIDUS, OR PROFUSE URINATION.—This disease is characterized by the excessive amount of urine that is passed.

Causes.—From being fed on swill food; from blood pressure in the kidneys; acrid, diuretic plants taken with food; excess of sugar in food; frozen food; moldy or musty hay and fodder; alkaline water and alkaline incrustation on the soil.

Symptoms.—The large amount of clear urine that is passed. If allowed to continue, animal becomes unthrifty.

TREATMENT.—

This is mainly in the change of diet to one more solid, and free from the cause of the affection. Boiled Flaxseed is very good in addition to the solid, wholesome, dry food, and by way of medicine use the following:

Iodide of Potash..... 1 ounce.
Water to make..... 1 pint.
Shake. *Dose:* 2 ounces, two or three times a day.

One-ounce doses of Fluid Extract of Ergot twice a day are also good. To correct the digestive function, give the Gentian and Nux Vomica tonic, as for "Chronic Indigestion."

BLOODY URINE IN CATTLE—HAEMATURIA.—This is a common affection among cattle in certain localities.

Causes.—From injury to loins or kidneys by external violence; from active congestion of the kidneys from calculi; eating acrid herbage, and eating of frozen roots may cause the affection. It is also a symptom of diseases in which the urinary organs themselves are not diseased.

Symptoms.—It is simple haematuria when blood is found in the urine in clots, or when, under the microscope, the blood globules can be detected. It is smoky urine when no distinct clots or discs can be found, but merely a general browning, reddening, or blackening of the urine, by presence of dissolved blood-coloring matter. If due to gravel, gritty particles are usually passed, and may be found in dish in which liquid is caught; if from injury to loins, there is likely to be some loss of control to limbs, and more or less paralysis of the tail. If without blood globules, it likely results from other diseases, from irritating plants, and

from eating frozen roots. There may be fever or not, with tenderness of abdomen on pressure, and with or without marked paleness of mucous membranes, and general weakness. When direct injury to kidneys is the cause, urine will be passed often and in small quantities, and with much straining. When there is a watery blood from lack of nourishment, fever is absent, and red water is at first the only symptom. When cause has been irritant plants, there will be abdominal tenderness, colics, and other signs of bowel inflammation.

TREATMENT.—

This will depend whether cause has been a direct irritant operating on a subject in vigorous health, or from some cause acting on an animal deficient in blood and vigor. In the first case, give a smart purgative—1 to 1½ pounds of Epsom Salts—to clear the bowels and allay fever. Sometimes this, with a liberal supply of good, wholesome food, will be all that is required. boiled Flaxseed and wheat bran is especially good.

In the case of diuretic plants, give 1-drachm doses of Fluid Extract of Belladonna and 1 ounce of Alcohol, repeated three or four times a day.

Also apply hot fomentations over the loins. In cases due to sprained or fractured loins, to inflamed kidneys, or to stone, or gravel, the treatment must be for the particular disease in question. When from anæmia, or watery blood, whether from badly adjusted rations, or from running on marshy soil, treatment must be tonic and stimulating. Rich, abundant, and digestible food must be given. Also, as a tonic, the preparations as for "Chronic Indigestion." In some cases, in addition to foregoing, 1-drachm doses of Quinine three times a day are of value. Where simply a symptom of some disease, not directly affecting the urinary organs, treat as for disease causing the condition.

ALBUMEN IN THE URINE—ALBUMENURIA.—

This is very similar to Bright's disease in the human being; not very common.

Causes.—Chronic inflammation of the kidneys, which in turn may arise from various causes. The long continued use of poor food may cause the disease. Injury to the loins may also cause it.

Symptoms.—When trouble arises from injury to the loins, back will be arched and feet drawn together, but in ordinary cases the most common and characteristic symptom is stretching at full length and getting the hind and fore feet as far apart as possible. Generally there is constipation, straddling gait, stiffness and disinclination to move. To test the urine for albumen, boil a little in a tube, or bottle, and it becomes cloudy; let it cool and then add a little Nitric Acid, and if it still remains cloudy it is due to albumen; if the cloudiness clears up, it was due to other causes. Death may result from paralysis of hind parts, from blood poisoning, or from coma (stupor).

TREATMENT.—

Will usually be directed to the disease on which it is dependent. In the absence of any other recognizable disease, mucilaginous drinks of boiled Flaxseed, Slippery Elm, or Gum may be given, Tannic Acid, ½ drachm, twice daily, and fomentations or even Mustard poultices over the loins. When the disease is chronic, and there is no attendant fever (elevation of temperature), tonics (Hydrochloric Acid, 6 drops in a pint of water; Phosphate of Iron, 2 drachms, or Sulphate of Quinine, 2 drachms, repeated twice daily) may be used. In all cases, the patient should be kept carefully from cold and wet; a warm, dry shed; or, in warm weather, a dry, sunny yard or pasture being especially desirable.

RETENTION OF THE URINE—DYSURIA.—

Causes.—May be brought about by eating acrid food, causing inflammation of the urinary organs, and irritability and spasms of the neck of the bladder. May be due to a calculus in the urethra, preventing the flow. Tumors pressing in the urethra may cause it. The two most common causes in cattle are spasms of the neck of the bladder, and calculi. Paralysis of the bladder may sometimes be a cause.

Symptoms.—There are frequent and ineffectual attempts to pass urine, with straining and colicky pains. The animal keeps stepping with his hind legs. Shows pain by groaning; is off feed. By examining through the rectum, the bladder is found to be full of urine. See the same disease in the horse.

TREATMENT.—

Will depend largely on the cause. If due to eating irritating substances, give a purgative, as 1½ pounds of Epsom salts; also give 1-drachm doses of Fluid Extract of Belladonna four or five times a day, and 1-ounce doses of Chloral Hydrate two or three times a day. Also apply hot blankets to the loins, and give injections per rectum of water at a temperature of 110 to 115 degrees. The same treatment, with the exception of the salts, should be given in all cases of spasm of the neck from whatever cause. With the cow, pass the catheter at once and relieve the animal; with the male this is a difficult operation, but if the obstruction is a calculus in the urethra the operation has to be performed, requiring a veterinarian. The urethra is cut down upon and opened where it rounds the arch just below the anus, and the catheter passed from that point. If the calculus is between this point and the end or the penis, the operation will afford only temporary relief, the animal urinating through the cut until it heals. The only way to produce permanent relief is to locate the calculus, and remove it by an operation. In the cow, the catheter is passed the same as in the mare, except as the finger is passed along the floor of the vulva, just before it reaches the opening into the urethra, it will enter a little blind depression, and in passing the catheter it enters this instead of the urethra; to get the catheter to pass this into the urethra, keep the finger in the depression, and try and work the catheter on into the urethra; the depression and the urethra are close together, separated by simply a thin membrane, and it is quite difficult to get the catheter to enter the urethra, but by perseverance it can be passed. If the obstruction should be a calculus and it is pushed back into the bladder, treat as for "Gravel and Stone in the Bladder."

INCONTINENCE OF THE URINE—ENURESIS.—This trouble may be considered as the opposite of the one just considered; the urine dribbles away involuntarily.

Cause.—Paralysis of the muscle at the neck of the bladder.

Symptoms.—The urine dribbles more or less continuously.

TREATMENT.—

The same as for the same disease with the horse (page 139), the dose of the drugs used being nearly twice as large.

INFLAMMATION OF THE BLADDER — CYSTITIS.—This is inflammation of the bladder, affecting more especially the mucous membrane lining the same.

Causes.—Any derangement of the digestive organs is apt to change the character of the urine, making it acid and irritating, instead of alkaline, as in health. In other instances, cystitis is caused by eating poisonous plants, by calculi, and incautious use of diuretic medicines. Retention of the urine will also cause it.

Symptoms.—The animal is more or less off feed; there is a rise of temperature; pulse accelerated; animal shows uneasiness, and there is frequent passing of urine in small quantities, or many times, the attempt to pass will be without results, the bladder being empty, but the sensation due to the inflammation is the same as when urine is present. The urine that is passed is hot and high colored, and contains mucus. By examining, through the rectum, the bladder will be found to be sensitive. Unless relieved the animal becomes very weak, fever high, pulse weak, and death follows.

TREATMENT.—

Give a mild purgative—1 to 1¼ pounds of Epsom salts—and aside from this, the treatment as recommended for the horse with the same disorder (page 135). Use the Linseed tea in place of water for the drink; apply the hot blankets, and flush out the bladder in the cow (in the male this will have to be omitted); and use the drugs with the dose increased.

GRAVEL AND STONE IN THE BLADDER—CALCULI.—In cattle there are sometimes found one or more hard lumps of material, commonly called "stones" or "gravel." They may occur in the bladder, in the kidneys, or in the duct leading from the bladder to the outside, called the urethra. They are composed of salts, usually containing lime, deposited by the urine in the form of concretions. They vary in size from that of

shot to that of an egg, but in most cases they are small and irregular in form. Technically, when in the bladder, they are known as "cystic calculi."

Symptoms.—These vary, but in general there is irritation and difficulty in passing the urine, the animal standing and straining after passing it. The urine often contains a little blood and mucus. They may cause inflammation of the bladder and we then get symptoms of that disease. If the bowels are emptied by an injection, they can sometimes be felt if the oiled hand is passed into the rectum and applied to the bladder, which lies just below it on the front part of the pelvic floor. In some sections the disease is common, while it is rare in others. The reasons for this are not definitely known, but are thought to be associated with an excess of mineral substances in the food and water. If the calculus is in the urethra it produces obstruction to the flow of urine.

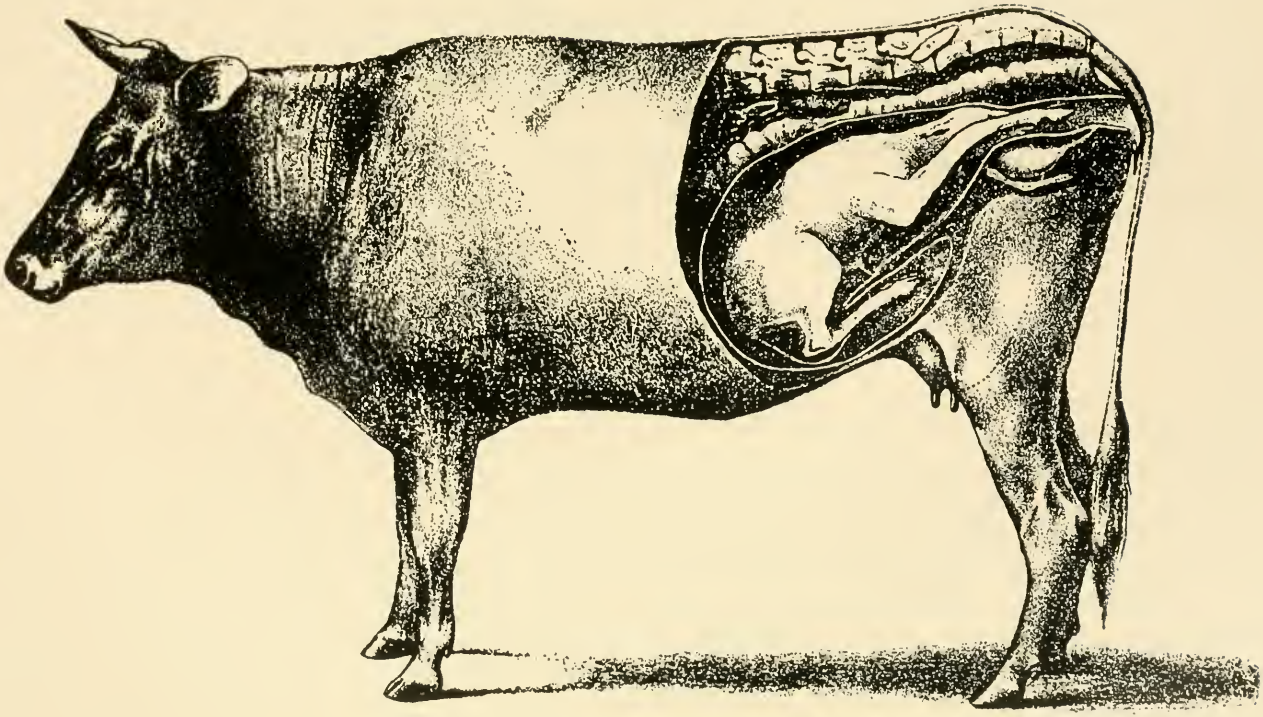
TREATMENT.—

The treatment is the same as for the horse (page 136). If the acid treatment is used, the dose is one and one-half that given to the horse. If an operation is necessary, it is performed the same as in the horse and requires a veterinarian.

CALVING (PARTURITION) AND DISEASES ATTENDANT.

HOW TO TELL WHEN A COW IS WITH CALF.

—Ordinarily when the cow is in perfect health she will come in heat every third week, when not pregnant. If a cow remains for three or six weeks after service without showing signs of heat, she is probably with calf. There are exceptional cases, but this is the rule. After taking service, and cow is with calf—pregnant—she will cease coming in heat and will thrive and feed better, and is of a quieter disposition than before. After a few



CORRECT POSITION OF CALF IN THE UTERO

weeks she commences to get larger in the flanks, which is more noticeable on the right side on account of the calf lying mostly on that side. Calf gradually grows, and at the end of the fifth or sixth month can be seen to move at the side after the cow has taken a drink of cold water, and by pressing the hand in quickly at the right flank one may feel the calf, which is easily told by the shape and solidity of the object. An examination through the rectum will show her condition. Springing begins in young cows about four months before calving, and udder gradually increases until parturition, while older cows "begin to make bag" from four to six weeks before calving.

THE PERIOD OF GESTATION IN COWS.—From extended statistics it is found that the average period of gestation in the cow is 285 days, or about nine and one-half calendar months. A calf born at the 240th day may live, and a case is reported, by an authority, as born on the 336th day. In most cases of prolonged pregnancy the offspring was a male.

SYMPTOMS JUST PREVIOUS TO PARTURITION.—During the last few weeks of gestation, the vulva gradually enlarges, but more noticeably so the last few days before parturition, and while the udder has been gradually forming for three or four weeks, it fills up more rapidly and becomes much harder during the last two or three days. Another quite noticeable symptom which occurs a few hours before the act takes place, is the appearance of the hollows, one on each side of the hips, back close to the tail. This symptom shows more plainly upon the thinly-muscled dairy animals than upon the thicker-muscled beef animals. Any time after these symptoms appear, the pains are liable to come on, or they may be delayed for some reason for a day or two, and so the animal should be watched and given a place where she will be undisturbed during the act of parturition itself, and for a little time afterwards.

TROUBLES MET WITH IN CALVING—(MALPRESENTATION).—After those symptoms appear which indicate that parturition is liable to occur at any time, the animal should be watched quite carefully; not more than four or five

hours should elapse without seeing her. In fact, sometimes the act occurs without noticeable warning symptoms, and so after the normal period of gestation, all preparations should be made for her comfort; a clean, well-bedded box stall, or a place at pasture, if the weather is mild, neither too hot or cold, by herself. The immediate symptoms of parturition are the same as in the mare; the animal is a little uneasy; lies down and gets up; utters low moans; upon getting up, turns around and looks where the hips were lying; back is arched, tail elevated; these symptoms indicate that the contractions of the womb have commenced, and very soon the animal will commence to strain, the efforts gradually getting more severe as the act progresses. The normal positions for the calf are the same as those given for the colt, and if the position is correct, the act will generally be completed without any assistance. The act is generally more prolonged with the cow than with the mare, often requiring, when everything is normal, an hour or more (see FOALING, page 152).

If the fœtus is a little large, and the throes are not able to expel it, assist the animal a little by taking hold and gently pulling when she strains; be sure, however, that the presentation is correct before pulling any; here is where a great mistake is often made—a part of the fœtus is seen protruding from the vulva, and it is caught hold of and pulled upon, oftentimes by two or three strong men, regardless of the position of the fœtus. This is all wrong—never do it.

If, after the animal has labored an hour or such a matter, no apparent progress having been made, make an examination and determine the cause. In making the examination, follow carefully the instructions for examining the mare. Have the hand and arm clean, the finger-nails clean and short, use the Carbolized lard, and be gentle. If the instructions are followed, the examination can do no possible harm, and if anything is wrong the sooner it is corrected the better. Never let an animal labor three or four hours without an examination. The pain suffered during this time is infinitely greater than that which a careful examination will cause.

It is never best, when the act is progressing fairly rapid, to take the calf away suddenly by pulling upon it; if this is done

the womb stops contracting to a great extent, remains large and flabby, and bleeding is apt to result.

If, upon examination, the position is found to be correct, withdraw the hand carefully and allow the act to progress undisturbed; if, however, the position is found to be incorrect, correct it at at once, remembering the principles given for correcting in the mare, or if the presentation is bad, send at once for some one of experience, and in the meantime keep the cow quiet by giving an ounce of Chloral Hydrate in a pint of water, or 2 drachms of Fluid Extract of Belladonna. Cover her warmly, and if the straining continues and is severe, place the hand in the womb and hold the fœtus from coming back farther.

Corrections are more easily made with the cow than with the mare, the neck and legs of the calf not being so long as with the colt.

THE AFTER TREATMENT.—

After delivery, leave the mother with her offspring undisturbed, simply watching to see that none of the accidents, which sometimes follow the act, occur. Do not be in a hurry to feed her, she needs nothing for twenty-four hours, and then only a little laxative food for three or four days, when the feed may be gradually increased. Give her a small amount of water soon after parturition, and a little more every hour or so afterwards, until she gets all she desires. Do not turn the animal out in the hot sun for two or three days after calving, neither expose her to cold, stormy weather. With regard to milking her, see "Milk Fever" preventive treatment.

DROPSY OF THE WOMB BEFORE CALVING.— This is due to some disarrangement of the fetal envelopes, and there is an over-abundant amount of fluid secreted around the fœtus.

Symptoms.—The belly gets larger and larger, until the cow seems almost as broad as long, and on account of so much fluid forming, she becomes weak and has difficulty in getting up and moving about. Mild cases will simply give the animal the

appearance of being unduly large and will cause no serious trouble, the fluid escaping in the natural manner at the time of parturition.

TREATMENT.—

There can be but little done in this disease except to keep up the strength by giving good nourishing food, and using the tonics as for "Chronic Indigestion," unless it becomes so bad that the animal cannot get around, in which case the mouth of the womb may be gradually opened, the fetal envelopes broken, and the fluid allowed to escape; this, of course, will produce abortion, or premature birth in case the period of gestation is nearly completed.

PARALYSIS OF THE HIND QUARTERS BEFORE CALVING.—This is generally noticed in poorly-fed and unthrifty cows, especially if exposed to cold or wet, and is caused by the calf in the womb pressing on the nerves that go to supply the hind quarters with power.

Symptoms.—Are the loss of power in the hinder parts. The animal is unable to get up, but in every other way appears normal.

TREATMENT.—

Give ½-pound doses of Epsom Salts once or twice a week, according to action on the bowels, and give the following powder:

Ground Gentian Root	4 ounces.
Saltpeter	4 "
Powdered Nux Vomica	4 "

Mix, and give a tablespoonful in a slop twice a day.

Give plenty of good food and keep cow warm. Have good bedding under her, and turn her from side to side three times a day, until she calves; then she will generally come out all right. Never attempt to put her in slings; let her lie until she is able to get up. If she does not get up after calving, continue the treatment, and also rub the loins and sides of the hips twice daily with strong Turpentine and Ammonia Liniment. (See PRESCRIPTION, in the back of book.) If this fails, a blister may be applied.

CLOSURE OF THE NECK OF THE WOMB AT CALVING.—It sometimes happens that when calving time has come, and labor pains come on, that the neck of the womb keeps contracted or closed, not allowing the calf to pass.

Symptoms.—The animal labors, but no progress is made, and an examination shows the mouth of the womb closed.

TREATMENT.—

Give the following drench:

Epsom Salts	1 pound.
Sweet Spirits of Niter	1 ounce.
Fluid Extract of Belladonna	1 drachm.

Mix in a quart of lukewarm water and give as a drench.

Keep body warm with blankets and apply hot salt in a bag to the loins. Also take a small sponge or soft piece of cloth, tie a string to it and saturate it with Fluid Extract Belladonna, 2 or 3 drachms, then insert it like a plug into the neck of the womb. In an hour or two examine again; if still as tight as before, re-apply more of the Belladonna. Do not use rough treatment, but after the Belladonna has been applied for one-half a day, try again to dilate with the fingers, and if it fails, an operation will probably have to be performed, which will require the veterinarian, and if possible get one at the commencement of the trouble. While the Belladonna is acting, quiet the animal by giving 1-ounce doses of Chloral Hydrate in 1 pint of water, repeated once in three or four hours.

PARALYSIS, OR PALSY, AFTER CALVING.—This consists in a more or less complete loss of control of the hind limbs, occurring after calving.

Causes.—From low condition, weakness and exposure to cold, or to injurious pressure on the nerves of the hind limbs by a large calf passing through the pelvis.

TREATMENT.—

Give the following drench:

Epsom Salts	1¼ pounds.
Sweet Spirits of Niter	1 ounce.
Tepid Water	1 quart.

Keep the body warm with blankets, and apply ¼ pound of Mustard, mixed in vinegar, over the loins every second day. Feed on soft food, with boiled Flaxseed in it. Milk cow dry twice a day, and turn her over three or four times a day from side to side, but do not put her in slings. Also give 2-drachm doses of Fluid Extract of Nux Vomica three or four times a day; if twitching of the muscles occurs reduce the size of the dose. If this treatment fails, use liniment and blister as recommended for "Paralysis before Calving."

PROLONGED AFTER-PAINS.—These sometimes occur after protracted and painful delivery, from failure of the womb to contract, or from retention of the after-birth; from nervous irritation; or from bleeding.

Symptoms.—The animal continues to strain after the fœtus is expelled.

TREATMENT.—

Examine to try and find cause; if from bleeding, give treatment for "Flooding." If there is another fœtus, and correctly presented, leave alone; if the womb is large and flabby, dash a little cold water on the loins, and onto the vulva, and give, internally, drugs to quiet. If everything in the womb seems to be normal, it is due to nervous irritability, and quieting drugs are to be given. For this, give 1 ounce of Chloral Hydrate and 1 drachm of Fluid Extract of Belladonna in ½ pint of water, and repeat in an hour, if pains continue; apply hot blankets, or salt bag, to the loins; blanket warmly. Remain with the animal continually until straining stops, to prevent womb from being everted; when she strains, clasp the lips of the vulva and hold them together.

FLOODING, OR UTERINE HEMORRHAGE.—

Causes.—Too rapid calving, and a consequent failure of womb to contract when calf has been removed; protracted labor; from injuries to these parts during parturition; or from unskillful removal of placenta. Eversion of the womb may also cause it.

Symptoms.—Blood may be flowing from the vulva, or in examining for cause of "After Pains" one will find blood clot in womb.

TREATMENT.—

Dash cold water with force onto the loins; cool the hand and insert it into the womb, which will sometimes cause the latter to contract upon it. If these means are ineffectual, inject cold water into the womb through a rubber tube furnished with a funnel; or inject Alum or Copperas water into the womb, using 2 ounces of either to each quart of water; fill the womb full and clasp lips of vulva to retain the solution for a few minutes. In very obstinate cases a still stronger solution could be used, or the womb can be packed with clean, soft cloth wet with the solution, but do not pack unless absolutely necessary. Internally, give 1 ounce of Fluid Extract of Ergot, repeat in one-half to one hour, and again in an hour if necessary. After all bleeding has stopped, clean out all blood clots by flushing the womb with cool water, that has been recently boiled.

RUPTURE OF THE WOMB; OR, PASSAGE OUT FROM THE WOMB.—These troubles occur at the time of calving in the cow, in the same manner as in the mare in foaling, and for symptoms and treatment see "Rupture of the Womb," or "Rupture of the Vagina, or Passage," in the HORSE DEPARTMENT.

REMOVING AFTER-BIRTH, OR CLEANING.—It sometimes happens that the cleaning, or after-birth, is retained, and if so, means must be taken to assist in the removal. This is more apt to occur with the cow than with any of the other animals.

Cause.—Is a congested and swollen state of the buttons on inside of the womb, to which the after-birth is attached. The cow often retains the after-birth for twelve hours or more before it comes away, but if retained much longer than this, it will probably not come away without help.

TREATMENT.—

If the cow retains the after-birth for more than five or six hours, give the following:

Epsom Salts	1 pound.
Fluid Extract of Belladonna	1 drachm.
Sweet Spirits of Niter	1 ounce.
Water	1 quart.

Mix, and give as a drench.

Blanket well and keep a peck of hot salt in a bag on the loins; give a hot bran mash and keep her quiet, and the after-birth may come away. If in thirty hours it has not passed away, it will have to be removed mechanically.

In removing the after-birth from a cow, the anatomy must be remembered. Scattered over the inside of the womb are some forty to sixty large, button-like enlargements, at this time nearly as large as one's fist; these are attached to the womb by a restricted neck, and are called "cotyledons." On the outside of the fetal envelope are saucer-shaped masses, corresponding in number to the cotyledons, and the attachment of the envelope to the womb is accomplished by the saucer-shaped structure fitting over and being attached to the cup-shaped cotyledon, much as the palm of one hand would clasp the closed fist of the other hand. The attachment can be rather crudely illustrated by a style of glove fastening. The surface of the saucer-shaped structure has a large number of small, pointed bodies, projecting from it, which fit into depressions in the cup-like cotyledon, and these hold the two together.

To remove the after-birth: Place the cow with her right side against a partition; have an assistant stand by her left side and keep her from arching her back by rubbing on the loins with a small stick. Bare the right arm to the shoulder, clean the finger nails and hand, and oil hand and arm with Carbolized lard; take that part of the after-birth which hangs from the vulva in the left hand, and twist it into a rope; make the right hand cone-shaped, and pass it gently into the vulva along this rope-like structure; upon reaching the womb, the rope will seem to be made up of a large number of strings running together; follow up one of these and it will lead the hand to a cotyledon. The

large, cup-shaped cotyledon is to be left on the womb, the saucer-shaped structure on the envelope is to be separated from it; to do this, slip the neck of the cotyledon in between the first two fingers, place the thumb on top of the cotyledon and press down as the fingers clasp the neck quite firmly, and slip along it towards the thumb. If they adhere too closely to be separated in this way, gently work the fingers in between the two structures and separate them, remembering that only a thin outer portion of the mass is to be taken off. Repeat the process with each of the masses. Be gentle, and don't hurry. Twist occasionally with the left hand, but pull but very little. When the cotyledons have all been separated, the entire mass will slip away and the operation is complete. Sometimes it is an easy matter to separate the cotyledons, at other times a difficult task. If no putrefaction has taken place, nothing need be done after the envelopes have been removed; if some decomposition has taken place, flush out the womb with a weak Carbolic Acid solution, 2 drachms to a quart of water (see "Abortion").

TURNING OUT OF THE VAGINA, OR PASSAGE LEADING FROM THE WOMB -EVERSION OF THE VAGINA.-

Causes.—From standing, before calving, in a stall with the hind feet too low; and while lying down, on account of its being so full, the womb presses back against the passage and turns it out. It may occur for a few days after parturition, from straining, or may be caused from constipation in effort to pass the feces.

Symptoms.—There protrudes from the vulva a red tumor; if small, it may go back when animal gets up, but if larger, it remains out, becomes swollen and hard; may be as large as a peck measure. The animal stands with the back arched, and strains more or less.

TREATMENT.—

As soon as discovered, secure the animal so she can not bruise the part in any way, and get an assistant. Then clean, by pouring over it cold water; this also reduces the size; if all

the dirt does not flush off, pick it off gently; do not rub the part in cleaning. When clean, pour over it a quart of Alum or Copperas solution, using an ounce of Alum or ½ ounce of Copperas to a quart of water, and also pour over it a weak Carbolic Acid solution—two drachms of the acid to a quart of water. Return in the same manner as recommended in the mare, and retain it with the sutures in the same way (page 160). It must be returned gently, otherwise abortion may be produced. After returning, keep the cow on a floor that slants slightly forward. When the labor pains come on, remove the sutures, and after the calf is born, the after-birth best be removed, and the sutures put back in again for a few days. After the accident, keep the bowels loose with laxative food, and, if necessary, small doses of Epsom Salts; and also give a tablespoonful of Saltpeter twice a day for a few days. To relieve the pain and straining somewhat during the operation of returning, give 1 ounce of Chloral Hydrate, or 2 drachms of Fluid Extract of Belladonna in ½ pint of water at the outset; also repeat two or three times a day if straining continues after the operation.

WOMB, OR CALF BED, TURNED OUT—EVERSION OF THE WOMB.—This is the turning inside out of a greater or less portion of the womb itself.

Causes.—From cow lying with her hind parts too low. After-pains may cause the cow to strain and turn it out. Or it may follow removing the after-birth, especially if roughly done. It sometimes is thrown out almost immediately.

Symptoms.—There lies, or hangs, behind the cow a large pink, bag-like mass, covered with mulberry-like excrescences all over the surface. It very soon swells and becomes a hard tumor-like mass, hanging from the vulva nearly to the hocks, or lying out behind the animal if she is down; a very repulsive sight.

TREATMENT.—

As soon as noticed, secure the cow so she cannot injure the part and get three assistants, and a veterinarian if possible, and turn the case over to him. First, have two of the assistants support the organ by placing a clean sheet under it, the same as

was recommended with the mare (page 162) ; also at the outset give something to quiet—an ounce of Chloral Hydrate or 2 drachms Fluid Extract of Belladonna in ½ pint of water. Clean the womb the same as with "Eversion of the Vagina," using the Alum and Carbolic Acid solution the same. Be sure all dirt is removed ; the use of the Carbolic lotion is very important. If the after-birth is still attached, remove it before cleaning. When ready to return, proceed as recommended with the mare, being careful not to injure the organs with the finger nails. Have the hind limbs of the animal higher than the front ones, and have an assistant keep the animal from arching the back by pressing on the loins. When it is returned, pass the oiled hand in and smooth it out. Retain by using the sutures as for "Eversion of the Vagina" in the mare (page 160). Keep her from straining as much as possible by repeating the Chloral Hydrate or the Belladonna once in three or four hours. Keep the hind feet much the higher.

After Treatment.—While this accident is not quite as serious with the cow as with the mare, yet it is serious, and needs careful attention.

Give the cow a liberal laxative—1 to 1¼ pounds of Epsom Salts ; feed lightly on laxative food; grass if in season, if not, a little hay, bran mash and scalded oats ; and also use the following :

Fluid Extract Aconite..... 2 drachms.
Fluid Extract of Belladonna..... 1 ounce
Saltpeter..... 3 ounces.
Water, to make ..... 1 pint.

Shake. *Dose:* 2 ounces, three or four times a day.

If the animal shows weakness, also give 2 ounces of Alcohol in ½ pint of water three times a day.

If the temperature keeps nearly normal (101 degrees), and the pulse also nearly normal, the conditions are favorable for recovery ; but if temperature runs up, pulse becomes rapid and hard, and animal dull, it indicates that inflammation is setting in and the conditions are unfavorable; then treat as for "Inflammation of the Womb." If everything goes along nicely for three or four days, recovery will probably take place. Do not let the

calf suck the cow. Leave the sutures in for a week or ten days. If the womb is much injured while out, the chances for recovery are slight. If very badly injured, it can be amputated; a veterinarian would be required for the operation. If the cow recovers, and is a valuable breeding animal, she may be bred again, paying special attention the next year, to see that the accident does not again occur.

INFLAMMATION OF THE VAGINA—VAGINITIS.—This may occur independently of inflammation of the womb.

Causes.—From lacerations, bruises, or other injuries, sustained during calving.

Symptoms.—There is swelling of the lips of the vulva, which, together with their lining membrane, become of a dark red, or leaden hue, and the mucus discharge increases and becomes whitish, or matter-like, and may become offensive. Passing of the oiled hand causes pain, and the walls will be found to be thickened, making the cavity much smaller.

TREATMENT.—

Slight cases recover without treatment, or under warm fomentations and mild antiseptic injections, as:

Carbolic Acid	2 teaspoonfuls.
Water	1 quart.

Severe cases may go on to the formation of large sores, or a considerable portion of the mucous membrane may die and slough off. In all severe cases the antiseptic, and warm water injections, must be applied perseveringly; and also use the following:

Acetate of Lead	3 drachms.
Water	1 quart.

Inject into the vagina twice a day with a rubber tube and funnel.

Hyposulphite of Soda (2 ounces, to 1 quart of water) is also excellent for an injection; alternate with the Lead lotion. Internally, give from 1 to 1½ pounds of Epsom Salts, feed on laxative food, and give a tablespoonful of Saltpeter three times a day for a few days. If the disease is allowed to run and becomes chronic it is called "leucorrhea."

INFLAMMATION OF THE WOMB—METRITIS.—This disease, when it occurs, usually comes on two or three days after calving.

Causes.—From getting wet, or standing in a draft; from injuries received in difficult calving; or from dirty hands, ropes, or instruments, used when assisting. It also follows eversion of the womb, and may occur when it is difficult to assign a cause.

Symptoms.—Slight shivering; the horns, ears, and legs are cold, the pulse is rapid and hard, the breathing quick, the temperature elevated, 104 to 107; cow loses appetite and stops chewing her cud; countenance depressed; is restless and uneasy in the hind legs, as though in pain; is tender to pressure on the right side, especially if jarred in the right flank; the vulva is swollen, and there is a discharge from it mixed with blood; the bowels are costive, and urine is high-colored; the animal lies down most of the time, sometimes refusing to get up at all; when up, stands with back arched. By passing the hand into the rectum the womb is recognized as enlarged and hard, and more or less sensitive to pressure. The secretion of milk is diminished. The disease is sometimes mistaken for milk fever, but need not be; with this disease there is a marked rise of temperature, while in milk fever the temperature is normal, or below. With milk fever the animal is unconscious; with this condition she is conscious, although she may refuse to get up.

TREATMENT.—

This is a serious disease and very often terminates fatally. The treatment is both internal and local. Internally give a laxative, 1 to 1¼ pounds of Epsom Salts, and repeat half dose in two days if the effects of the first dose are not quite marked. Also give the following:

Fluid Extract of Aconite	2 drachms.
Fluid Extract of Belladonna	1½ ounces.
Fluid Extract of Colchicum Seed	1 ounce.
Saltpeter	3 ounces.
Water to make	1 pint.

Shake. *Dose:* 2 ounces three or four times a day.

If she shows great weakness, give 2 ounces of Alcohol with each dose of the above in ½ pint of water; and if the fever runs high,

give 2 drachms of Acetanilid twice a day with the Alcohol. After two or three days take the Aconite out of the above prescription and put 3 drachms of Fluid Extract of Digitalis into the prescription in its place.

Apply to the loins, continuously, blankets wrung from hot water ; change every half hour and keep the hot blankets covered with a rubber blanket and dry woolen blankets. Have the water as hot as the animal will stand. It is also well to flush out the womb, part of the time, with a mild antiseptic lotion, as Carbolic Acid 2 drachms, water 1 quart ; and part of the time with an astringent lotion, as Acetate of Lead 3 drachms, water 1 quart; or Hyposulphite of Soda, 2 ounces to a quart of water, is good. Use each lotion about twice a day. Flushing with large quantities of water at a temperature of 115 degrees, just before injecting the above lotions, is a good practice. For injecting, use a soft rubber tube with a funnel in one end. After flushing, if the cow strains, watch to see that the womb is not everted. In using the injections and in flushing, be sure the solutions enter the womb. The tube best be carried through the vagina with the hand and inserted into the womb ; have the hand and tube well oiled with Carbolized lard, and insert it carefully. If the animal lies down, roll her gently from one side to the other two or three times a day ; keep her lying on her chest. Give her all the fresh water she wants to drink, but in small quantities at a time, and a very little laxative feed if she desires to eat.

PUERPERAL FEVER.—This is a simple fever occurring at the time of parturition.

Causes.—Undue exposure to cold, or wet, or to hot sun. Also occurs when the animal is unthrifty; with animals that have been highly fed for a time before parturition, or fed too quickly after parturition. Young animals are more susceptible than older ones.

Symptoms.—It may develop any time within two or three days after parturition. There is a slight dullness, partial loss of appetite, a rise of temperature, 103 to 106; pulse more rapid than normal, 60 to 90 beats per minute; the mucous membranes of the

eyes and nose are red; the milk secretion is partially stopped, and the udder is apt to be inflamed. These same symptoms are met with in other disorders at this time, and so we have to recognize this disease by the absence of the symptoms characteristic of other diseases.

TREATMENT.—

The disease generally runs a mild course, but complications sometimes arise, and so treatment should be given—even in mild cases. Give the cow a laxative—from 1 to 1½ pounds of Epsom Salts, dissolved in two quarts of water. Feed lightly on laxative food for a few days, and also give the following:

Fluid Extract of Aconite..... 2 drachms.
Fluid Extract of Belladonna..... 1 ounce.
Saltpeter..... 4 ounces.
Water to make..... 1 pint.
Shake. *Dose:* 1 ounce, three or four times a day.

Watch for complications, and if any should develop, treat as for that disease.

WHITES — LEUCORRHEA.—This is due to a continued or chronic inflammation of the womb, the vagina, or of both these organs.

Causes. — Usually results from injuries sustained in calving as the result of rough handling, or from irritation by putrid matters in connection with retained after-birth, or from the use of some object in the vagina, as a pessary, to prevent eversion of the womb. Very apt to follow abortion. The disease will also develop when it is hard to assign a direct cause.

Symptoms.—The principal symptom is the glairy white discharge flowing more or less constantly from the vulva (sometimes more when the cow lies down), soiling the tail, matting its hairs and those of the vulva. When lips of vulva are drawn apart, the mucous membrane is seen to be redder than normal, if vagina is affected. The discharge has more or less of an offensive odor. Health may not suffer at first, but if discharge continues and is putrid, the health fails, milk shrinks, and flesh is lost. If womb

is involved, the hand passed into the vagina may detect mouth of womb slightly open and some of the liquid collected within its cavity. With oiled hand in rectum, the outline of womb beneath may be detected, somewhat enlarged. In some cases cow may be in heat oftener than normal, and it may be more intense, but she rarely conceives, and if so, generally aborts. In other cases she does not come in heat at all.

TREATMENT.—

In mild or recent cases, give injections as in "Inflammation of the Vagina." In more obstinate ones stronger solutions may be used after the womb has been washed out by a stream of hot water at a temperature of 115 degrees, until it runs clear. To do this, insert a rubber tube into the womb, carrying it through the vagina with the hand; oil hand and tube; place a funnel in its raised end, and pour the water and afterward the solution through this. Hold the lips of the vulva together until the womb and vagina fills, and hold the solution in for a few minutes. If neck of womb is so closed that the liquid will not flow out, withdraw the tube and let it flush out and then refill. As injections, use:

Acetate of Lead	3 drachms.
Water	1 quart.

Mix and inject as above directed.

Or, instead of this, use:

Sulphate of Iron	3 drachms.
Water	1 quart.

Or, another good injection is:

Hyposulphite of Soda	1 to 2 ounces.
Water	1 quart.

It is also well to use, part of the time, the following antiseptic injection:

Carbolic Acid	2 drachms.
Water	1 quart.

At the beginning of the treatment, flush out with the water and use one of the injections every day; later, once in two days, and as improvement takes place, once in three days.

Internally, give the following:

Sulphate of Iron..... ½ pound.
Saltpeter..... ½ "

Mix. Dose: Tablespoonful in moistened grain, twice daily.

If the animal is unthrifty, alternate with the foregoing the Nux Vomica and Gentian tonic, as recommended for "Chronic Indigestion."

* **MILK FEVER—PARTURIENT APOPLEXY**—The term "milk fever" is not a correct name for this disease, as there is rarely any fever associated with it; in fact, the temperature is usually below normal. Neither is the latter name entirely correct. It does not follow difficult or protracted labor, flooding, nor retention of the placenta, as is the case with puerperal fever, with which it is sometimes confounded, but is a disease of well-fed, large, milk-producing cows, and when it occurs, it nearly always follows an easy parturition.

Causes.—The exact cause of the disease is not known, but certain things seem to predispose to it. High feeding before parturition, getting the animal into what would be called an excellent condition, is a well-recognized predisposing cause. This is dangerous, however, only with mature cows, and good milkers; heifers with first, or second, calf do not have the disease, neither do light milkers. It is a disease of the dairy cow.

Symptoms.—In many cases the cow is down and partially, or entirely, unconscious, when disease is first noticed. If the attack is seen early, the first symptom is uneasiness. The cow keeps stepping with the hind feet, is dull, appetite gone, and milk secretion is lessened, or stopped. If the cow is forced to walk, there is a reeling of the hind limbs; there is also a sort of vacant stare to the eyes. These symptoms increase until the cow is unable to stand, and falls, or lies down. After going down the head is usually turned toward the side, with the nose against the side of the chest, just back of the elbow. In severe cases the cow is totally unconscious, but in mild cases only partially so. If the head is straightened out in front, a sort of kink will be

* See new treatment in Addenda, page 782.

seen in the neck. Often there is a slight moan with the breathing, due to the stupor. Sometimes, instead of lying as above, the cow is delirious, thrashing about almost continuously. The temperature is about normal, or a little below, pulse somewhat rapid. The feces collects in the rectum, but is seldom passed off, and the urine remains in the bladder. With this disease the cow is to a great extent unconscious, or delirious, and so it need not be mistaken for other conditions. The fact that there is no fever, unless there is some complication, also helps distinguish it from inflammation of the womb, for which it is sometimes mistaken by the inexperienced.

TREATMENT.—

It is very important, in treating this disease, that the cow be kept lying upon her brisket. Keep her bolstered in this position with bags of straw if necessary; let the head lie around against the side. See that her front and hind feet are under her naturally for lying in this position. She should be rolled from one side to the other, three or four times a day. Blanket the cow warmly; it is a good plan to put bottles of hot water or bags of hot salt under the blanket. Clean the feces from the rectum two or three times a day with the hand; also draw the urine with a catheter three times a day. To draw the urine, see "Suppression of the Urine," under DISEASES OF THE URINARY ORGANS.

Internal treatment must be very carefully given, as the animal will not swallow, and the medicines will pass into the lungs and cause inflammation of them. Never drench a cow after she goes down, and very carefully after the first symptoms show, and before she goes down.

The following may be given, by giving very slowly:

Fluid Extract Belladonna	½ teaspoonful.
Fluid Extract of Nux Vomica	½ "
Fluid Extract Digitalis	15 drops.
Water	2 tablespoonfuls

Mix, and give as one dose every two hours. Elevate the nose a little and give a tablespoonful slowly into the back of the mouth; after a few minutes give another, and so on, until the dose is given.

Along with the foregoing, give the treatment into the udder, known as the Schmidt treatment. Great care is necessary in using this treatment, or the udder will be inflamed; *everything must be very clean.* The necessary equipment is a milking tube, a piece of rubber tubing about two feet long, a small funnel, a quart bottle, and a quantity of 3 per cent. Carbolic Acid solution —Carbolic Acid 1 ounce, water 1 quart—and 2½ drachms of Iodide of Potash—the drug to be injected. First clean the quart bottle with hot water, and then put into it 1 ounce of the Carbolic Acid solution and shake it; now put into it the 2½ drachms of Iodide of Potash. After this fill up the bottle with water that has been recently boiled, pouring directly from the teakettle into the bottle; set the bottle into a dish of water nearly as hot, to prevent its breaking. After the bottle is filled, cork it, and we know the bottle is free from germs. Cool the solution until it is the temperature of milk, by setting it in a pail of warm water and then gradually cooling the water by pouring cold water into the pail. The solution is now ready to inject into the udder. Fasten the milking tube into one end of the rubber tube, and put the funnel in the other end, and place in a dish containing some of the Carbolic Acid solution—enough to cover the tube and rubber; dip up some of the solution and let it run through the tube. These instruments should be clean. Place the rest of the Carbolic Acid solution into another dish. To inject, milk all the milk from the udder, then pick up one of the teats and wash it off with the Carbolic Acid solution, especially the end of the duct. Have the assistant pick up the funnel, taking hold of the outside of it, and raise it up so the solution all runs out; take hold of the milking tube and insert it into the teat, taking care that it does not touch anything after it leaves the solution until it enters the teat; elevate the funnel, dash a little of the Carbolic Acid solution over the mouth of the bottle, remove the cork and pour one-fourth of the amount into the funnel. Let the funnel empty two or three times so that some air will be forced into the udder. Remove the tube from the teat and place it in the Carbolic Acid solution; cork the Potash solution; clean another teat, and inject in the same manner. Repeat with each of the teats. The principal point in the injection is to see that everything is

clean, and use the Carbolic solution freely on instruments, hands and teats. After injecting the solution, knead the udder gently for ten to fifteen minutes. If the animal shows no improvement after eight or ten hours, strip out the udder and repeat the injection: it may be repeated again in ten or twelve hours later if required, using only 2 drachms of the Potash. A cow often recovers from the disease very rapidly, being on her feet and showing a desire for food in three or four hours after improvement commences; on the other hand, they often die very quickly. It is very hard to tell which way the disease is going to turn from the appearance of the animal; some cases which seem to be light, terminate fatally, while what seem to be very severe cases, get well.

Another treatment which is coming into use, and seems to be even more successful than the Schmidt treatment, is the Oxygen treatment, which consists in filling the udder with Oxygen gas. This treatment requires a veterinarian, and in small places they cannot get the gas.

After the cow gets up, give her from 1 to 1½ pounds of Epsom Salts, if she did not have any before parturition; and also give a tablespoonful of Saltpeter, three times a day for a few days. If she has required three or four doses of the Iodine treatment, she will come to her feed slowly and also to her milk slowly.

PREVENTION.—As this disease can in many cases be prevented, the preventive treatment is important. Do not give heavy milkers, rich, milk-producing food for a time before calving. If the cow is in good pasture, put her into poorer, or in the stable and feed hay. Do not feed silage after a cow goes dry, until after calving. Keep the bowels loose by giving occasional pound-doses of Epsom Salts, commencing two weeks before, and give every three or four days, giving the last dose, if possible, just before she calves, or immediately after. Also give Saltpeter, a tablespoonful once or twice a day, commencing two weeks before parturition should take place. Another preventive measure which some consider very valuable, is not to milk the cow dry after delivery; taking only what the calf wants for a couple of

days, and then gradually taking a little more, until the fifth or sixth day she can be milked dry. Many things go to indicate that this is a valuable preventive measure, and is perfectly safe. Do not commence to feed milk-producing food for four or five days after parturition. The fact that an animal has the disease once is no indication that she will have it again.

INFLAMMATION OF THE MILK-BAG OR UDDER—MAMMITIS—GARGET.—This is an inflammation of the mammary gland. Sometimes the term "caked bag" is applied to it. The term "garget" is used more when the milk secretion is changed, and appears as a thick or stringy fluid. This disease usually occurs at the time of parturition, but it may appear any time during the period of lactation.

Causes.—May arise from irritation or injury, as kicks, blows, or another animal stepping on the udder; from the retention of the milk too long without being drawn; by germs entering the udder; by exposure, being out in cold rains or lying on wet ground. It often follows the careless use of the milking tube.

Symptoms.—Adverse type of mammitis that takes on the active inflammatory character may be ushered in by a shivering fit, which is succeeded in a short time by fever and dullness. In the milder forms these symptoms are absent, and only the local symptoms in the udder are present. The udder becomes hot, and hard, red, swollen, and sore. In bad cases, it being so painful to touch, the cow is averse to being milked. Milk is often curdled, and sometimes bloody. The trouble may stop here, and terminate by a change for the better, or it may go on to suppuration, the pus, in some cases, discharging inside and coming away with the milk, and in others, through an opening on the outside. Again it may not fester at all, but become hardened, and remain permanently enlarged, or it may become gangrenous and slough off. The inflammation may attack one quarter only, or all the udder. Sometimes the only symptom indicating that there is inflammation present, is a little thick or bloody milk. Some cows are quite susceptible to this condition.

TREATMENT.—

If dependent on calving, and the cow is fat and feverish, give a good laxative:

Epsom Salts	1 to 2 pounds.
Ginger	1 ounce.
Water	2 quarts.

And follow this with ½-ounce doses of Saltpeter two or three times a day, and in very bad cases, along with this, 15 or 20 drops Fluid Extract of Aconite, and 1 drachm Fluid Extract of Belladonna. Foment the udder with hot water several times a day, and after each fomenting rub the udder well with one of the following: Camphorated Oil, or:

Camphorated Oil	4 ounces.
Turpentine	1 ounce.

Shake.

The following is also good:

Witch Hazel	3 ounces.
Soap Liniment	3 "
Fluid Extract of Belladonna	2 ounces.

A very good method is to alternate the lotions. In bad cases, the fomenting should be kept up almost continuously; this can be done by suspending the udder in a shallow bag; to suspend, pass straps, or strings, from the front corners of the bag over the loins and tie, and from the back corners of the bag between the hind legs and up, and tie to the front strings where they pass over the loins. Place a folded grain bag on the loins under the strings; pack in the bag, around the inflamed part of the udder, woolen cloths, and pour over these, every fifteen minutes, water as hot as the animal will stand. If an abscess forms, continue fomenting until it points and then open and treat as given for "Abscesses." If it becomes hard, use Iodine Ointment (see PRESCRIPTIONS, back of book).

If the milk in the udder is thick and difficult to get out, inject into the udder a little recently boiled water that has cooled down in the teakettle; inject, as in "Milk Fever." After injecting, gently knead the udder for a few minutes to break up

the thick milk, and then milk out; repeat the process, if necessary. If there is reason to believe that the inflammation is due to the action of germs within the udder, inject into it a mild antiseptic lotion, as:

Lysol	2 drachms.
Water	1 quart.

Shake.

Inject from 4 to 6 ounces into each affected quarter; knead gently for ten minutes, and then milk out; repeat three times a day.

In mild cases, where there is simply a little thick or bloody milk, the dose of Epsom Salts and the use of the Saltpeter for a few days will generally correct; if not, use the lotions.

In the more severe attacks, feed lightly, withholding the milk-producing foods. This disease should always receive prompt attention, for if severe it is apt to destroy a portion of the udder. When the udder shows inflammation before parturition, as it so frequently does, first try the Epsom Salts and Saltpeter, and if this does not check it, commence milking the cow and use the local applications.

SMALL ROUND LUMPS IN THE MILK PASSAGE.—Little pea-like tumors sometimes grow in the milk passage, in the teat, resulting in some cases in its complete obstruction and the subsequent loss of the quarter.

Symptoms.—The presence in the duct of a small body which prevents to a greater or less extent the flow of the milk.

TREATMENT.—

This is oftentimes quite unsatisfactory. At first try applying to the outside of the teat, over the obstruction, Tincture of Iodine; apply two or three times a day and rub in well. If this does not relieve, a little weak tincture may be injected directly into the duct; dilute a little Tincture of Iodine with equal parts of water, close the duct above the obstruction, so the solution cannot go into the udder, by pinching the teat between the thumb and finger, then inject into the duct through a milking tube the Iodine solution; repeat once a day. If this fails, it is sometimes

possible to pass a fine-looped wire into the duct, hook it over the obstruction and remove it. Everything else failing, the obstruction can be cut down upon and removed; this best be done when the cow is dry, but can be done when giving milk. Whenever possible, leave the operation to a veterinarian. To operate, use the Cocaine solution, injecting a little of it inside the duct as well as rubbing on the outside (see OPERATIONS, page 347). Pass a milking tube, and then cut down onto the duct, just a little to one side of the growth, and with a pair of scissors remove the obstruction. Sew up the wound. If giving milk, use the milking tube until the wound heals; if dry, pass the tube twice each day until healed, to prevent duct from closing up. (See "Passing the Milking Tube.")

PASSING THE MILKING TUBE.—The milking tube is a small tube of silver or hard rubber, for introducing into the duct of the teat to draw the milk, when, for any reason, it can not be got in the normal way. It is very simple to pass the tube up into the teat, but in order to prevent inflammation of the udder as the result of the irritation produced, great care should be taken in using the tube. The tube should be perfectly clean and, before being used, placed in a Carbolic Acid solution; a convenient way to do this, is to tie a small string around the end which does not go into the teat, and then drop the tube into a small bottle of the solution; by leaving the string outside, the tube can be readily taken out for use; put it into the solution a few minutes before using it; in introducing it, take hold of it below the part which enters the teat, shake a little, to remove the Carbolic lotion, apply a little clean Carbolized lard—lard, 1 teacupful, Carbolic Acid, 1 teaspoonful—and gently push it into the duct, introducing it only far enough to pass the obstruction. Unless carefully used, the tube will cause inflammation, and destroy the quarter.

BLOODY MILK.—

Causes.—Blood may escape with the milk from injury to the bag; when it is congested or inflamed; when the circulation through the udder is, for some reason, suddenly increased, and the small blood vessels rupture.

TREATMENT.—

The treatment will vary with the cause. If due to injury, or inflammation, treat as under "Inflammation of the Udder." If simply due to a congestion, and there seems to be no inflammation, give a tablespoonful of Saltpeter three times a day; if this fails to correct the trouble, give with the Saltpeter a teaspoonful of Fluid Extract of Belladonna, and apply to the udder the Witch Hazel and Belladonna liniment, as for "Inflammation of the Udder." A dose of Epsom Salts will sometimes prove effectual.

BLUE MILK.—

Cause.—From the presence in the milk of germs (bacillus cyanogenus), milk takes on a skyblue color; these germs generally enter the milk after it leaves the udder, but in some cases the germs may get into the ducts of the teat and enter the milk as it passes out. If the germs are thought to be in the udder, flush it out with the Lysol solution, as recommended under "Inflammation of the Udder." Use:

Lysol	2 drachms.
Water	1 quart.

After injecting it into the udder and kneading the gland, place a finger over the end of the duct, force some of the solution into the duct and hold it there for a few minutes, and then milk out. Repeat, if necessary. Also give all milking utensils a good scalding.

STRINGY MILK.—Stringy milk is another condition of the milk which is produced by certain germs getting into it. The germs may get into the udder by cows being allowed access to stagnant ponds, where they can get the udder covered with mud and slime. Cows giving milk should not be allowed access to stagnant ponds, or be forced to drink water from such places. The water they drink should be pure.

TREATMENT.—

Same as for "Blue Milk."

CHAPPED OR SORE TEATS.—

Causes.—From anything that irritates them. The sudden chilling of the teat in winter after the calf has let go, or after the completion of milking with wet hands; contact with cold water or putrid water, or with filth in lying down; from cows running through the wet grass; or, flies may be the cause.

TREATMENT.—

Each time, after milking, rub the teats with some healing ointment, as the following:

Vaseline	2 ounces.
Oxide of Zinc	1 drachm.
Carbolic Acid	25 drops.

Mix well together, and apply as directed.

Or:

Vaseline	2 ounces.
Subnitrate of Bismuth	½ ounce.
Carbolic Acid	25 drops.

Mix.

Or.

Glycerine	1 ounce.
Witch Hazel	1 ounce.
Carbolic Acid	½ drachm.

Shake.

"White Lotion" (page 263), is also good to apply to the teats.

In some cases a tablespoonful of Saltpeter, given internally twice a day, will prove of value.

WARTS ON THE TEATS.—These are often troublesome, yet they may be greatly benefited or entirely removed by smearing them thickly after each milking with pure Olive Oil. If they persist, they may be cut off with a sharp pair of scissors and the sore touched with a stick of Lunar Caustic. They may then be oiled and the caustic repeated if necessary, to prevent their return. Applying a little Acetic Acid to the warts once in three or four days will remove them. If there are a large number on the teat, treat only a few of them at a time.

CUTS AND INJURIES TO THE TEATS.—

Causes.—The teats of cows are often injured by barb wire; from other animals stepping on them, etc.

TREATMENT.—

The treatment will depend upon the injury. If a cut, and it extends into the duct, it should be sewed up; if the teat is torn, the edges must be brought together in such a way as not to leave the duct open. To sew up, first apply to the edges of the wound a little of the Cocaine solution (see OPERATIONS, page 347), then bring the edges together and hold them there with stitches. Be sure the wound is clean before sewing up (see WOUNDS). Draw the milk with a milking tube until healed, and keep the cow quiet and well bedded.

Injuries which do not open the duct may be treated with ointment as under "Chapped or Sore Teats." When the end of the teat is injured, care must be taken or the duct will close and make milking difficult. To prevent this, keep in the end of the teat a little plug, shaped something like a bone collar button, a button with a rather small round head answers fairly well if the neck of the button is large enough to keep the duct from closing too much. Keep this in the end of the duct all the time, except when milking, and use a tube for drawing the milk until the injury is healed.

FISTULA, OR EXTRA DUCTS OF THE TEAT.

—Sometimes an extra duct will lead from the main duct out on the side of the teat, or at one side of the end, the extra duct eading into the main duct before it reaches the udder; sometimes the extra duct will lead into a small, extra gland near the base of the teat.

Causes.—The condition is present at birth, except where it results from an improperly treated wound.

TREATMENT.—

If the two ducts unite before reaching the udder, close the one which is out of place as follows: Rub the end of the duct for a few minutes with the Cocaine solution (see OPERATIONS, page 347), then make a little cut about half an inch long through the center of

the opening and lengthwise of the teat—cut in about one-half way to the main duct; then scrape the duct where it is cut open until it is raw, and put in a stitch and draw the edges of the wound close together. The best time to operate is when the cow is dry. If giving milk, use the milking tube until the wound heals.

If the extra duct leads into a small gland, the little gland can be destroyed by injecting into it a little diluted Tincture of Iodine; dilute a little Tincture of Iodine with an equal amount of water and inject a little of it into the part to be destroyed. This will set up inflammation, which will destroy the part. Before doing this, be sure the extra duct does not lead into the main gland; in such a case do not inject, but close the end as described above.

STRICTURE OF THE DUCT AT THE BASE OF THE TEAT.—Sometimes it is found, when a cow freshens, that the milk will not come down into the teat—it is closed where it joins the udder. The closure is due to a membrane forming across the duct, where it unites with the cavity in the udder.

TREATMENT.—

The treatment is to break the membrane; this can be done by pushing a milking tube through it, but the hole thus made is so small that the milk will not come down, except through the tube, and by passing the tube at each milking, the quarter soon becomes inflamed, and so the teat bistoury has to be used and the stricture cut. To use the instrument, the little knife is drawn within the tube, it is then passed the same as a milking tube until the knife is beyond the stricture, the knife is then pushed out and the instrument drawn down past the stricture, cutting it; when below the stricture, the knife is again concealed and the instrument withdrawn from the teat. It may be necessary to cut the stricture in two directions. The milk flowing through at milking time will keep the cut from closing up.

ABORTION AND PREMATURE BIRTH.—Premature expulsion of the fœtus is called abortion in the earlier periods of gestation, and premature birth in the latter part of

gestation. It not infrequently takes on a contagious character, which will be treated under "Contagious Abortion."

Causes.—Poor condition; weakness and too watery a state of the blood; being hooked or pushed about by other cattle, or kicked or clubbed by brutal attendants; jumping, leaping or falling; irritant poisons; and any severe sickness may act as causes.

Symptoms.—In the first two or three months of pregnancy no symptoms may have been observed, and unless the aborted product is seen, the fact of abortion may escape notice. The cow coming in heat later on, suggests that the accident happened. Some soiling of the tail with mucus, blood, and the waters, may be seen, or udder show firmness, and in virgin heifer or dry cow a few drops of milk noted, or the fœtus with membranes found. In advanced pregnancy, abortion is much the same as parturition with like symptoms. The important thing is to distinguish the early symptoms in order to apply treatment, and try to arrest the progress of the trouble. A cow is dull, sluggish, separate from the herd, chewing cud languidly, or there may be frequent lying down and rising; uneasy motions of hind feet or tail; back arched and tail carried well back from the body, and slightly accelerated pulse and breathing. If these conditions exist in a pregnant cow, examine for any increase in mucus in vagina, or for blood or liquid there or on root of the tail; for enlargement, or firmness of the udder, or in dry cows for milk, and for any slight straining like labor pains.

Although the first symptoms of trouble may have appeared, in some cases, further progress can be checked. So long as the foetus has not perished, or water discharged, nor water-bag presented, progress of disease should be stayed, if possible; and as it is impossible to tell whether these conditions do exist or not, the treatment is given to all cases. If any of the foregoing conditions have taken place, the treatment will be unsuccessful, and abortion will take place.

TREATMENT.—

Place the animal in a quiet place, and give quieting drugs; Chloral Hydrate in 1½-ounce doses, or Laudanum in 2-ounce doses, giving either one with a drachm of Fluid Extract of

Belladonna in ½ pint of water; repeat in two hours; again in three or four hours; and then three or four times a day. Also give from 1 to 2-ounce doses of Black Haw (*Viburnum Prunifolium*), repeated three times a day. This drug has a special quieting action on the uterus. If treatment fails, the labor will increase and the foetus be expelled. Where it takes place late in the period of gestation, assistance may be needed as with normal parturition, and the same principles, with regard to making an examination, should be carried out.

The after treatment is important; if there is any reason to suspect contagious abortion, treat as under "Contagious Abortion" in CONTAGIOUS DISEASES OF CATTLE. If thought to be due to other causes than contagion, keep the cow by herself for a week or two, feed laxative foods, or, if these cannot be had, give ½-pound doses of Epsom Salts every second or third day; also give a tablespoonful of Saltpeter and a teaspoonful of Fluid Extract of Belladonna three times a day for a week. It is also well to flush out the womb once a day with an antiseptic, or an astringent, lotion, as for "Inflammation of the Womb." Do not breed the cow again for two or three months. Abortion is quite apt to be followed with leucorrhea, and so the after-treatment is important. If the after-birth does not come away, it should be removed the same as with normal parturition.

BARRENNESS IN COWS AND BULLS—STERILITY.—This is an inability to reproduce the species. Such an animal is called a "non-breeder." The trouble is more common among pure bred, highly-fed cattle than with the so-called "scrubs."

Causes.—In cows, from their being kept in a high condition; from diseased ovaries; contracted or diseased neck of the womb; from womb being deformed in some way, as twisted to one side; being one of twins, the other of which is a bull—a free-martin; from altered mucus secretions; leucorrhea, etc.

In bulls, it may be from fatty degeneration of the testicles, seen most in old bulls; from malformation or disease of the genital organs; from high feeding and too little exercise; from poor feeding; the using too freely, especially when young.

In both bulls and cows, it may come from being too closely inbred for several generations.

TREATMENT.—

In cows, if from high condition, restrict feed, give opportunities for liberal exercise, and give her a physic of 1½ pounds of Epsom Salts in a quart of tepid water, as a drench; also give a tablespoonful of Saltpeter twice a day for two or three weeks. Examine the cow and if the mouth of the womb is closed, try to open it by gently inserting the finger. If this is difficult, tie a string to a small wad of cotton batting, saturate with the Fluid Extract of Belladonna and press this into the mouth of the womb and leave it there for an hour; also give a teaspoonful of the Belladonna internally and apply hot applications to the loins. After an hour or two, again try to open the womb and, if successful, breed the cow. Cone-shaped structures made of sponge, called "tents," are also used to press into the mouth of the womb, which, when moistened, soften and enlarge the mouth. These can be procured of instrument dealers. If there is leucorrhea or any disease of that nature present, treat by flushing out the womb as described under "Leucorrhea," using the same lotions. If everything seems to be normal, and yet the cow fails to conceive, give for one month the tonics as recommended for "Chronic Indigestion," and follow this for two weeks with the following:

Fluid Extract of Belladonna..... 1 drachm.
Camphor..... 1 drachm.
Asafetida..... 1 drachm.
Thin Linseed gruel..... 1 pint.
Give as one dose, twice daily.

In case of the bull, if he has been closely confined, and rather highly fed, reduce the feed and give exercise; to do this, stretch a large wire between two posts or trees which are some distance apart, and high enough so the bull can pass under it; have a ring on the wire, and near the ends fasten something to the wire so the ring will not slip up close to the tree (keep it far enough away so the bull cannot pass around the tree and get tangled up) and fasten the bull to the ring on the wire by means of a rope four to six feet long, fastened to the ring in his nose. If he does not

exercise much, make him, by taking a whip and driving him back and forth at a good, sharp pace for half an hour, three times a day. After he gets quite poor, gradually bring him back into condition again by good feed, and the use of the tonics as for "Chronic Indigestion," and continue the exercise. During treatment, do not allow him to cover any cows. Working in a tread power is excellent exercise for a bull. If there is any disease of the generative organs, treat accordingly.

NYMPHOMANIA.—This is an excess of desire for sexual intercourse on the part of the cow. Such cows will take the bull at any time, but rarely ever conceive, and when they do, nearly always abort. In some sections they are called "bullers."

Causes.—Usually from chronic inflammation of some of the generative organs. It may also be excited by an excess of highly nitrogenous food, as beans, peas, vetches, wheat bran, middlings, etc.; especially if there is a lack of exercise, and subject to the constant association of a vigorous young bull.

Symptoms.—The animal is in a state of continual sexual excitement, and is constantly riding, or being ridden, by other cattle; in bad cases, the excitement and actions are such as to keep the animal in poor flesh.

TREATMENT.—

This will vary with the cause. Overfeeding on rich food should be stopped, and exercise given in an open field by herself. Diseased ovaries may be removed by spaying (see in OPERATIONS). Catarrh of the womb and passages may be treated as called for in "Leucorrhea." Internally give 1-pound doses of Epsom Salts every four or five days, and also use the following:

Fluid Extract of Belladonna	1 drachm.
Camphor	2 drachms.
Saltpeter	½ ounce.
Thin gruel	½ pint.

Give as one dose, twice a day. Continue for two weeks, withhold, and then give again if necessary.

DISEASES OF YOUNG CALVES

SUSPENDED BREATHING IN NEW BORN CALVES.—The moment the circulation through the navel string is stopped, death promptly follows unless breathing is established. Fortunately the desire to breathe, aroused by the circulation of the venous blood and the reflex action from the wet and chilling skin, usually at once starts the contractions of the diaphragm and other respiratory muscles, and life is insured.

Causes.—Among the causes of suspended breathing before and during birth are: compression of the navel cord stopping circulation, while fœtus is still in such a position that respiration cannot commence; the detachment of fetal membranes from the womb too early in the act of parturition; a run-down, weakened condition in the calf from starvation or disease in the cow; fainting in a debilitated calf, when calving has been prolonged; when the calf is born with head so wrapped in membranes that it cannot breathe; and tenacious phlegm in mouth and nose acting in like manner.

TREATMENT.—

Give attention to calf at once and relieve it of its investing membranes, and of any mucus that has accumulated in nose and mouth. Wiping out the nose deeply with the finger or a feather excites to sneezing, and in this way to breathing. Blowing into the nose has a similar effect. Sucking the nostril through a tube applied to it is even more effective. Slapping the chest with palm of hand or with a towel dipped in cold water, compression and relaxation alternately of walls of the chest, by carrying the front legs forward and apart, and then back, and crowded together, at the rate of about twenty movements per minute, may start the action, and ammonia fumes or tobacco smoke blown into the nose may suffice. Every second is precious, however, and if possible the lungs should be dilated by forcing air into them from a bellows or from human lungs. As the air is blown in through bellows or tube, the upper end of the windpipe

must be pressed back against the gullet, or otherwise the air will go to the stomach. In a large dairy, a piece of elastic tubing one-third inch in bore, should be kept at hand for sucking or blowing in such cases.

BLEEDING FROM THE NAVEL.—This may happen in two ways—when the cord is cut off too close to the navel and left untied, and when it tears off at the navel. It may also bleed when torn across naturally, if it is sucked by the dam or another calf. In an animal that has but little plasticity to its blood, it will flow under almost any circumstances.

TREATMENT.—

Where any cord is left it is always safe to tie it, and it is only when swollen and when it may contain a loop of the bowel, that there is any danger of doing so. By pressing upward any bulky contents, such danger is avoided. If torn or cut too close to be tied, the bleeding may be checked by applying powdered Alum or Copperas, holding in place with compress and tight bandage around the body, or by holding against it, for a fraction of a second, the end of a rod at dull-red heat. Before tying the cord or applying the astringents, wash with Carbolic Acid lotion and also wet the string, which is used to tie around the cord, in the same solution.

URINE DISCHARGED THROUGH THE NAVEL.—Before birth the urine passes from the bladder by a special tube, the urachus, through the navel and string into the outer water-bag. This at birth closes, and in the calf the tube is drawn in toward the bladder. It is more likely to remain open in the bull-calf. The urethra is sometimes abnormally narrow, or even closed, in the male.

TREATMENT.—

If part of the cord remains, tie it, as for "Bleeding from the Navel," and allow it to wither up naturally. If the end is too short to tie, apply the astringents as for bleeding. A blister of Spanish Fly, causing swelling of the skin, will often close the orifice. A hot iron may also be used. If the urethra of the male is closed, and cannot be opened, and the urachus is closed,

the urine will collect in the bladder and cause death, but oftentimes after the urachus is closed the urine will pass out through the natural channel.

INFLAMMATION OF THE NAVEL URINE-DUCT.—

Causes.—Inflammation of the urachus, or navel urine-duct, may arise from direct injury to navel in calving or shortly after, with or without irritant or septic matter on its cut or lacerated end.

Symptoms.—There is redness and swelling at the posterior part of the navel and an escape of urine and a whitish serous pus from the orifice of the urachus. Where the urine is not discharged there is a tender swelling, like a thick cord, that extends upward and backward from navel to abdomen. Navel enlargement may be considerable, but it is solid, and cannot be pressed back into abdomen as in hernia. In cases at first closed, the pus may burst out later from back part of navel and swelling extend backward. In some cases whitish pus may pass in urine by ordinary channel, showing that it has opened back into bladder. In other cases the umbilical veins are involved, and swelling extends forward as well as backward. Disease may result in destructive disorders of the liver, lungs, and above all, of the joints.

TREATMENT.—

Disease may be warded off, or made comparatively harmless, by applying antiseptics to the navel string at birth, as:

Carbolic Acid	1 teaspoonful.
Glycerine	2 ounces.
Water	2 ounces.

Mix and apply.

After a day or two, if discharge continues, apply White Lotion (see PRESCRIPTIONS, in back of book). If inflammation is extensive, apply hot fomentations or a poultice, holding in place by a bandage about the body. If joints become affected, treat as under the next disorder. In bad cases, also give internally 5 drops of Fluid Extract of Belladonna and a tablespoonful of Sweet Spirits of Niter in a little water, three or four times a day.

INFLAMMATION OF THE JOINTS IN CALVES —JOINT-ILL.—This occurs in young calves within the first months after birth. It may attack any of the joints, quite often the hocks or knees, and is usually connected with inflammation of the navel.

Symptoms—Are swelling in one or more joints, which are very hot and tender. Calf is stiff and lame, lies down constantly, and does not suck; there is very high fever, and quickened breathing and pulse; and there is inflammation, swelling, and pus-like discharge—often fetid—from the navel. There may also be symptoms of disease of liver, lungs, heart, or bowels, but the important point is to look to condition of the navel in all such cases of diseased and swollen joints beginning in the first month of life.

TREATMENT.—

Treat navel as in preceding disorder. Foment the joints with hot water, by putting a heavy woolen bandage about them and wetting this with hot water, as hot as the animal can stand; cover the wet bandages with a dry blanket; re-apply the water every half hour; also bathe the joints well, two or three times a day, with the following liniment:

Soap Liniment	3 ounces.
Witch Hazel	2 ounces.
Turpentine	1 ounce.
Laudanum	2 ounces.

Shake.

White Lotion (page 263), is also good to bathe the joints with.

Internally give the following:

Fluid Extract of Belladonna	2 drachms.
Fluid Extract of Aconite	½ drachm.
Fluid Extract Colchicum Seed	1½ drachms.
Sweet Spirits of Niter	4 ounces.
Water, to make	1 pint.

Shake. *Dose:* 1 ounce, three or four times a day.

Also give:

Hyposulphite of Soda..... 2 drachms.
Quinine ..... 10 grains.

Three times a day in a little thin gruel.

If abscesses form about joint, treat as recommended under "Abscesses."

CONSTIPATION IN CALVES—RETENTION OF THE MECONIUM.—At birth the bowels of a calf contain the "meconium," a tenacious, gluey, brownish-yellow material largely derived from the liver, which should be expelled within a short time after birth, that they may go on with their natural function. The first milk of the cow—colostrum—rich in albumen and salts, is nature's laxative to expel the meconium, and it should never be withheld from the calf. If for lack of this, from the dry feeding of the cow, or from any other cause, the calf is costive, straining violently without passage, lying down and rising as in colic, and failing in appetite, no time should be lost in giving relief; give an ounce or two of Castor Oil and 1 drachm Cascara Sagrada, assisting the action by injections of warm soapsuds or oil into the rectum. Whatever meconium is within reach of the finger should be carefully removed. It is also important to give the cow a sloppy, laxative diet. If the oil fails to move the bowels, give from 1 to 2 ounces of Epsom Salts in a little warm water.

The following may also be given in obstinate cases:

Fluid Extract of Nux Vomica..... 10 drops.
Fluid Extract of Jaborandi ..... 20 "
Aromatic Spirits Ammonia ..... 1 teaspoonful.
Water to make..... 2 ounces.

Shake. Give as one dose; repeat three times a day if necessary.

Restrict the feed until the bowels move.

INDIGESTION IN YOUNG CALVES.—

Causes.—This may occur from different causes, as costiveness, a too liberal milk supply; too rich milk; the furnishing of

the milk of a cow long after calving, to a very young calf; allowing a calf to suck the first milk from a cow that has, in any way, been violently excited; too long intervals between feeding; dirty, fermented milk; from feeding the mother unwholesome food; bad quarters; feeding starchy, artificial food; or overfeeding on artificial food. Licking hair off themselves, or others, and the formation of same into balls in the stomach, causes obstinate indigestion.

Symptoms.—Are dullness, indisposition to move, uneasiness, eructations of gas from the stomach, sour breath, more or less loss of appetite, lying down and rising as if in pain, fullness of the abdomen, which gives out a drum-like sound when tapped with the fingers. The costiveness may be marked at first, but it soon gives place to diarrhea, by which offensive matters may be carried off, and health restored. In other cases it runs into inflammation of the bowels, fever sets in, and calf ultimately dies.

TREATMENT.—

To clear the bowels, give 1 to 2 ounces Castor Oil, and also use the prescription as recommended in the preceding disorder, adding 10 drops Fluid Extract of Belladonna in case of much pain; and if sour eructations of gas from stomach are marked, give 2 tablespoonfuls of Lime water, or 1 teaspoonful Cooking Soda two or three times a day. If disorder continues after bowels are moved, give a large tablespoonful of Rennet, or 30 grains of Pepsin at each meal, along with the above mixture. If constipation recurs, give injections of warm water and soap, and treat diarrhea as in that disease. See next article. Feed good, wholesome milk, giving in it a teaspoonful of Blood Flour, and a little Linseed meal gruel.

WHITE SCOURS IN CALVES.—GASTRIC CATARRH—DIARRHEA.—Hand raised calves are subject to a form of diarrhea to which several names have been applied.

Causes.—Not common with calves which suck, though may be occasioned by their sucking at long intervals, thus overloading

the stomach and bringing on indigestion. Calves separated from their dams and given considerable quantites of cold milk at long intervals are liable to this form of trouble. Calves fed on milk substitutes frequently contract it, as do also those fed on milk from creameries, or from filthy pails.

Symptoms. — The passages have a thin, yellowish-white appearance, are quite offensive, and become very frequent. The calf becomes dull, whisks its tail as though in pain every time there is a passage from the bowels, loses its appetite, becomes weak, and unless disease is checked it is apt to run into dysentery, when the passages become bloody and very thin; calf shows more or less pain by grating the teeth, and depressed countenance.

TREATMENT.—

Give 1 to 2 ounces Castor Oil with a tablespoonful of Laudanum. This will clear the bowels. Then follow with teaspoonful doses of Laudauum three or four times a day. Dissolve a tablespoonful of Copperas in a pint of water and give 2 ounces of this solution in a little milk, three times a day. Give at different times than the Laudanum. Also give a teaspoonful of Cooking Soda or an ounce or two of Lime water. From a teaspoonful to a tablespoonful of Blood Flour is excellent for Scours, often checking severe cases without other treatment. In bad cases, where there is dysentery, use the following:

Corrosive Subfimate..... 7 grains.
Water..... ..... 1 pint.
Shake. *Dose:* 1 to 3 tablespoonfuls, three or four times a day.

Give a small amount of milk, three times a day, with 1 or 2 well-beaten, raw eggs. Give clean, dry bedding frequently and cover calf with a blanket.

INFECTIOUS SCOURS.—There is a form of scours which attacks calves two or three days after birth, and which terminates fatally in a short time. The disease is due to germs entering through the umbilical cord. Other organs as well as the bowels are affected, but the scouring is very characteristic.

Symptoms.—The scouring, great weakness, and death in a day or two.

TREATMENT.—

The treatment is preventive, as curative treatment fails. The prevention is to have everything very clean where the cow calves. The stall should be very clean; if other animals have used the same stall and their calves have died of the disease, the stall must be thoroughly disinfected and whitewashed before using again (see "Disinfection," page 66). As soon as the calf is born, remove it from the stall, wash the navel cord thoroughly with a Carbolic Acid solution—Carbolic Acid, ½ ounce; water, 1 pint—ligate the cord close to the body with a string that has been soaked in the same solution, and then cut the cord off one-half inch below the string. Apply to the cord four or five times a day, or until it dries up, the Carbolic lotion and also the White Lotion (see PRESCRIPTIONS, in back of book).

DISEASES OF THE GENERATIVE ORGANS OF THE BULL

INFLAMMATION OF THE TESTICLES—ORCHITIS.—

Causes.—Usually the result of blows, or other direct injuries, but may result from excessive service, or from some growth in the gland tissue.

Symptoms.—Bull moves stiffly, with straddling gait, and the right or left half of the scrotum in which the affected testicle lies is swollen, red, and tender, and the gland is drawn up in the sac and dropped down again at frequent intervals.

TREATMENT.—

Give the following as a drench:

Epsom Salts	1½ pounds.
Ginger	2 drachms.
Water, tepid	1 quart.

Foment the testicles well with hot water, the same as was recommended for fomenting the udder in inflammation of that gland (page 435), and use the same lotions on the scrotum, especially the one containing the Belladonna. When not fomenting, apply a Linseed poultice. While treating, feed on soft food, and give a tablespoonful of Saltpeter three times a day; if the bull is a large fellow, heap the spoon. Should a soft point appear, indicating formation of matter, open and treat wound daily, with a solution made by adding 2 teaspoonfuls of Carbolic Acid to a pint of water. Usually, when inflammation has gone to point of suppuration, the testicle is ruined for service, and must be removed by castration. A test, by putting bull to cows after he is well, will determine whether he will be of any more use in that line.

INJURIES TO SHEATH AND PENIS.—

Causes.—From jumping fence and being caught so as to injure parts; or in case of work oxen, from pressure and friction of the sling, when held in stock for shoeing.

Symptoms.—If there is severe crushing of both sheath and penis, it leads, some hours later, to the development of a hard, hot, and painful swelling, reaching from scrotum to sheath. There is fever, dry muzzle, red eyes, hard, full, rapid pulse, and quickened breathing. Animal stands with hind legs apart and urine dropping from sheath. Appetite and rumination suspended. Later, unless promptly treated, mortification may result, the swelling getting cold and doughy.

TREATMENT.—

In severe cases must be prompt and judicious. Put straps around the patient, with soft pads in contact with affected parts, constantly soaked in cold water for at least twenty-four hours. Give 1 to 2 pounds of Epsom Salts in 2 quarts of hot water, and a tablespoonful of Saltpeter three times a day if the penis is not badly injured. The second day the parts may be bathed with:

Extract of Witch Hazel	½ pint.
Sugar of Lead	1 ounce.
Laudanum	3 ounces.
Water to make	1 pint.

If active inflammation persists, the cold water application should be continued. If suppuration occurs, open at point of fluctuation when ready, letting out pus, and afterward syringe cavity with Carbolic lotion as for dressing wounds. Careful antiseptic treatment is also necessary in case of extensive sloughing, as sometimes happens with severe inflammation. In mild cases simply bathing parts three times daily with hot or cold water and applying the White Lotion (see PRESCRIPTIONS, in back of book) after wiping dry, continuing the treatment until well, will be found sufficient.

INFLAMMATION OF THE URETHRA—GONORRHEA.—This is an inflammation of the urethra—the canal which conveys the urine through the penis from the bladder.

Causes.—It may originate in gravel, the excitement of too frequent service, infection from a cow with leucorrhea, or from extension of inflammation from the sheath.

Symptoms.—There is an oozing of whitish liquid from the end of the penis and sheath, tenderness and pain when handled, and while there is no actual arrest of the urine, its flow is subject to voluntary checks, as it irritates the tender surface.

TREATMENT.—

Give 1½ pounds of Epsom Salts in a quart of tepid water as a drench; bathe the sheath well with hot water twice a day, and inject into the urethra a little of the following lotion:

Acetate of Lead	2 drachms.
Water	1 quart.

Or:

Permanganate of Potash	20 grains.
Water	1 pint.

Mix and shake well before using.

Inject part of the time with:

Lysol	1 drachm.
Water	1 pint.

To inject the solution, use a milking tube, a rubber tube and funnel, as for injecting into the udder in "Milk Fever." Put

the milking tube into the urethra at the end of the penis, elevate the funnel and pour the solution into it; the funnel should be held as high as the back.

Keep bull away from cows until he is cured, as some varieties of the disease are contagious.

CASTRATIONS OF BULLS AND CALVES.—This consists in removing the testicles, the essential organs of generation in the male. The best position for castrating bovines is standing, but they can be cast the same as the colt; the same kind of a throwing harness will answer. Use the Carbolic lotion the same as operating upon colts, or pigs; have the knife sharp. Before operating wash off the scrotum with the Carbolic lotion.

To operate standing, place animal with his right side against a partition, and tie his head short, so he cannot push forward; have an assistant stand against his left flank and hold him against the partition; the operator, with the knife in his right hand, stands with his left side against the left hip of the animal, facing to the rear; reach in between the legs from the rear with the left hand and grasp around the scrotum, just above the testicles, crowding the testicles to the very bottom of the sacs; make the cut in the center of the back side of each sac, commencing well towards the top of the testicle and carrying it down to the very bottom, so as to be sure of good drainage; try and make the cut onto the testicle with one stroke of the knife. When the testicle is cut onto, the pressure produced by the hand clasping the scrotum above will cause it to pop out of the cut; cut down onto both testicles before letting go of the scrotum. After the testicles pop out, take hold of one and draw it out a little and it will be seen to be attached at its front surface by a thin attachment to the front of the scrotum. Cut this attachment quite close to the testicle, and then it can be drawn down, being held simply by the spermatic cord; if a young calf, draw the cord down five or six inches, and cut it off; a dull pair of shears is a good thing to cut it off with, or it can be cut, or scraped, off with the knife; if scraped, or cut, with the dull shears, which mash close, there is less apt to be bleeding. If a larger animal, and danger of bleeding, draw the cord down and tie a string

around it, about three inches from the testicle, and then cut the cord off about an inch below the string; a catgut string is best; if silk is used, leave the ends long enough to hang from the cut, so that they will be pulled out later when they slough. Have the string lying in the Carbolic solution for a few minutes before using it. After both testicles are removed, dash a little of the Carbolic lotion into each wound. Place the animal in a clean stall. The day following the operation, wet the fingers in the Carbolic lotion and open the cuts. If there is undue swelling or bleeding after the operation, treat as is recommended for same condition under CASTRATION, HORSE DEPARTMENT. The best time to castrate calves is when they are about a month old; the pain is much less when they are small and there is less tendency to bleeding.

If there is a scrotal hernia, castrate by the covered operation, the same as with colts.

If the animal is cast, make the cuts in the sides of the scrotum; it is handier than to make them on the back side; otherwise the operation is the same as when performed with the animal standing.

"RIGS" OR RIDGLING BULLS.—These are animals in which the testicles, one or both, have never come down into the scrotum. They cannot be castrated like horses, and after attaining some age, become nuisances.

When castrating a calf and only one or neither testicle is down, fatten and get rid of it, for they rarely come down later. It will save much trouble to get rid of such when young.

SWELLING OF THE POINT OF THE SHEATH IN STEERS—STONE IN THE SHEATH.—

Causes.—From grazing in pastures where limestone abounds, or from drinking water impregnated with limestone, by which it is taken into the system, and this, together with the fact that the steer, in making water, does not protrude the penis, but lets it dribble out of the sheath; causes the lime in the urine to collect and form a concretion, or ball, which soon gets large and sets up irritation and swelling.

Symptoms.—The end of the sheath is enlarged, and it may obstruct the flow of urine, when animal will show uneasiness, pain, etc., as in "Suppression of Urine." An examination reveals the presence in the sheath of the limy deposit.

TREATMENT.—

If the animal is quiet, let him stand, and have him held by the horns and nose, while operator with oiled fingers passes one of them up into the sheath, and by manipulation and working the stone about, it can soon be removed, when the sheath should be oiled both inside and outside. In case animal will not stand to have this done, he can be cast and secured as in "Castration," or strap his hind legs together, putting the strap around above the hocks, crossing it between the legs like a figure 8, which prevents its slipping down.

DISEASES OF THE EYE

INFLAMMATION OF THE EYES—SIMPLE OPHTHALMIA.—This is an inflammation of the mucous membrane lining the eyelids and covering the eyeball. In severe cases the deeper coats of the eye may be involved.

Causes.—It may result from a bruise of the eyelid; from chaff, hayseed, dust, gnats, or such matter in the eye; from exposure to cold; from irritating or poisonous vapors arising from filthiness of the stable.

Symptoms.—A profuse flow of tears; closure of eyelids from intolerance of light, retraction of the eyeball, and protrusion of the haw; disinclination to move, and in milch cows diminution of milk. In parting the lid, the lining membrane is found injected with an excess of blood, giving it a red and swollen appearance; the white of the eye is bloodshot, and the cornea may be cloudy. If disease advances, inflammation of the cornea may ensue.

TREATMENT.—

Carefully examine the eye for the presence of chaff, dust, cinder, and the like, and remove same when found. Do this by flushing the eye with warm water, by means of a syringe, or, if substance adheres to eyeball or lid, it may be scooped out by the handle of a teaspoon or some other blunt instrument. If it removes with difficulty, drop a few drops of the Cocaine solution into the eye (see OPERATIONS, HORSE DEPARTMENT). To relieve congestion and irritation, use a wash composed of:

Nitrate of Silver	3 grains.
Morphine	1 grain.
Water	1 ounce.

Keep in the dark.

Mix, and put a few drops of this in the eye with a medicine dropper, a small, pointed glass tube with rubber bulb, three or four times a day.

Put animal in a cool, darkened stable, and fasten a woolen cloth, folded several times, over the eye, or eyes if both are affected. Keep wet with cold water, re-wetting every half hour during the day, but remove it at night. If there is much fever and constitutional disturbance, give 1¼ pounds Epsom Salts dissolved in 1 quart of water. Also give a tablespoonful of Saltpeter three times a day, and feed a laxative diet.

SPECIFIC OPHTHALMIA—CATARRHAL CONJUNCTIVITIS.—This form of inflammation of the membrane of the eye generally appears in epidemic form and affects quite a number of the herd.

Causes.—It is usually attributed to some irritant material carried in the air or coming from the soil, but is probably due to bacteria. It is most prevalent on low grounds and is seldom seen in winter months. It affects old and young alike, but one attack is believed to make the animal immune.

Symptoms.—This disease is characterized chiefly by a mucous, matter-like discharge from the eyes, an intense degree of inflammation of the mucous membrane, accompanied by swelling of the eyelids and an early darkening of the cornea. The flow of tears

is mixed with pus which gathers in large masses on the cheek. The eyes are kept closed. When the cornea is affected, the animal is frequently blind for a time, and sometimes other diseases of the eye follow.

TREATMENT.—

Animal should be placed in a cool, dark stable, supplied with soft, succulent food and plenty of fresh water to drink. Give 1 to 1½ pounds Epsom Salts in 2 to 3 pints of water. Also give a tablespoonful of Saltpeter, three times a day, and in bad cases give with the Saltpeter, 1 drachm Fluid Extract of Belladonna and 15 drops Fluid Extract of Aconite. Foment the eye with the cold water, as in the previous disorder, and also use the same solution in the eye. A powder composed of equal parts of finely pulverized Boracic Acid and Calomel is good to dust into the eye—blow a little into the eye twice a day from a quill or small, paper cylinder.

INFLAMMATION OF THE CORNEA—CORNEITIS.—This is an inflammation of the strong membrane, which forms the front part of the eyeball. The sclerotic, or white coat bordering on the cornea, becomes involved to some extent.

Causes.—As the cornea is the most prominent part of the ball of the eye, it is subject to injury in a variety of ways, such as scratches, pricks, contusions, lacerations and the like. It may occur from the extension of inflammation from ophthalmia, or from some internal inflammation, or may occasionally occur without any known cause.

Symptoms.—There is a severe inflammation of the part, causing a cloudiness of the cornea. The swelling on front part of eyeball may be in bladder-like points, or it may begin at outer border, abruptly thickening, and diminish to center. If whole cornea is affected, it has a gray or grayish-white appearance. The tears do not flow as freely, neither is the suffering so great as in ophthalmia. One or both eyes may be affected. In favorable cases conditions should begin to improve in a week. In unfavorable cases the sight is lost and the opacity remains.

In what is called suppurative corneitis—where there is a formation of matter—the symptoms are somewhat different, but

it may follow the above form. More commonly it develops rapidly by a raised swelling on or near the center of the cornea, that soon becomes yellow, while the edge of the swelling fades into an opaque (clouded) ring. Disease is seldom noticed until matter formation has occurred. When it is the result of diffuse corneitis, ulceration and escape of confined pus is inevitable; otherwise matter may be absorbed. When deep membranes are involved, the sight of the eye may be permanently lost. It will sometimes attack a number of animals, being more or less contagious.

TREATMENT.—

Place the animal in a darkened stable, give green or sloppy food, and 6 ounces of Epsom Salts, dissolved in a quart of water once a day. Also give the following:

Fluid Extract of Aconite	1½ drachms.
Fluid Extract of Belladonna	1 ounce.
Saltpeter	3 ounces.
Water to make	1 pint.

Shake. *Dose:* 2 ounces, three or four times a day.

As an application to the eye use the following:

Nitrate of Silver	3 grains.
Sulphate of Morphia	1 grain.
Soft water	1 ounce.

Keep in the dark. Drop 15 to 20 drops into the eyes, three times a day, with a medicine dropper.

If ulceration occurs, use Nitrate of Silver, 5 grains, to an ounce of water. Apply directly to the ulcers with a camel's hair brush. (See "Ulcers of the Cornea)."

To remove opacity after inflammation has subsided, continue the Nitrate of Silver solution.

ULCER OF THE CORNEA.—

Causes.—In consequence of the bursting of a small abscess in the delicate membrane over the cornea; or, in the cornea itself,

after violent corneitis, or specific ophthalmia ; or ulcer may be caused by bruises, scratches, and other direct injury to the cornea.

Symptoms.—At first the ulcer is a pale, gray color, with edges high and irregular, and discharges, instead of pus, an acrid, watery substance, and has a tendency to spread superficially and also to extend deeper. If it spreads superficially, the transparency of the cornea is lost ; if it goes deeply, and reaches the anterior chamber of the eye, the aqueous humor escapes and the eye is destroyed.

TREATMENT.—

Give internal treatment as with "Inflammation of Cornea," if it has not already been used, in which case continue it. Endeavor, as soon as the ulcer appears, to prevent its growth. Convert corroding process into a healthy one. For this purpose nothing is better than a strong solution of Nitrate of Silver. Drop a few drops of the Cocaine solution into the eye (see "OPERATIONS," HORSE DEPARTMENT). The animal's head is then firmly secured, and an assistant should part eyelids ; then all parts of the ulcer are touched, using a camel's hair brush, with a solution of 10 grains of Nitrate of Silver to an ounce of water. Repeat treatment once a day until ulcer looks healthy. When healthy action succeeds, ulcer assumes a delicate fleshy tint, and former redness around ulcer gradually disappears. In abrasions where there are no holes or cavities made, caustic treatment is not needed ; simply treat as for "Inflammation of the Cornea." Excessive ulceration may cause fungus growth upon the cornea, which appears to be nourished by loops of blood vessels in the mucous membrane covering same. This growth must be cut away and wound cauterized with Nitrate of Silver, or eye will be destroyed.

STAPHYLOMA.—This is a disease of the eyeball in which the cornea loses its transparency, rises above the level of the eye, and even projects beyond the eyelids, in the form of an elongated whitish, or pearl-colored tumor, which may be either smooth or uneven.

Causes.—Inflammation is the only known cause, although it may not occur immediately. It often follows catarrhal ophthalmia and corneitis.

TREATMENT.—

In a few cases restoration of sight may be affected by puncturing the projecting tumor and treating it afterward with Nitrate of Silver, as given in "Ulceration of the Cornea." Cases have been known in which spontaneous rupture of the tumor occurred and healing resulted without treatment.

CATARACT OF THE EYE.—This is a disease in which the crystalline lens becomes opaque and loses its transparency; power of refraction is lost and animal is blind.

Causes.—Generally it is the result of deep inflammation of the eye, but sometimes seems to be due to an improper nourishment of the lens.

Symptoms.—It is known by the whiteness of the lens, as seen through the pupil; the cornea is clear and healthy. Sight is totally lost when the cataract is fully formed. Formation is usually slow.

TREATMENT.—

There is no treatment with the lower animals. The lens could be removed the same as it is in the human, but it would not benefit, as animals cannot wear glasses, as is necessary in order that its removal may benefit.

AMAUROSIS.—This is blindness from paralysis of the optic nerve, and retina. The retina is the expansion of the optic nerve over the back of the chamber of the eye.

Causes.—Concussion from a blow on forehead, fracture of bone over eye causing downward pressure, rheumatic inflammation of optic nerves, or from extension of deep inflammation involving retina. It sometimes occurs from excessive loss of blood, or of great debility.

Symptoms.—This disease is seldom noticed until animal shows, by gait and actions, that it is blind. Generally both eyes

are affected. The eyeball remains clear, and the pupil permanently dilated. No response to light is manifested.

TREATMENT.—

If due to debility, or loss of blood, give tonics as for "Chronic Indigestion," but the treatment will probably be of no value.

INJURIES TO THE EYELIDS.—This accident is not uncommon where cattle are fenced in by barbed wire; an animal may be caught under the eyelid by the horn of another; may occur in the stable from projecting splinters of wood or from nails.

TREATMENT.—

If there is much laceration, the edges of the wound should be brought together closely and correctly, and held, either by sutures of silk or even linen thread (see "Sutures" in HORSE DEPARTMENT). Use the Cocaine solution (see OPERATIONS, page 347). Keep the parts dressed with the Carbolic Acid lotion, and if there is much swelling, or the inflammation extends to eye, use the cold fomentations, as for "Inflammation of the Eye."

INVERSION AND EVERSION OF THE EYELIDS.—See HORSE DEPARTMENT.

FOREIGN SUBSTANCES IN THE EYE.—Sometimes chaff, barley-beards, or splinters of wood, hedge-thorns, pieces of cornstalk, or leaves, stems of hay or straw, twigs, or weeds may penetrate the eye, break off, and remain, causing inflammation, blindness, abscesses, and the like. The eyeball sometimes is penetrated, but in most cases substances get between the eye and lids.

Symptoms.—Vary according to extent of injury, but in ordinary cases, animal will show evident suffering, or annoyance, by keeping eye closed, and, perhaps, by turning head slightly awry, and tears will run down over the cheek.

TREATMENT.—

Catch the animal and examine the eye and remove offending substance. Drop 15 to 20 drops of the Cocaine solution into the eye and the examination and removal of the object is quite easy (see OPERATIONS, page 347). When substance is removed, apply treatment as case seems to require; cold fomentations and the lotion as recommended for "Inflammation of the Eye" will generally bring about recovery. If the eyeball is punctured nothing can be done other than the fomentations and lotions. This generally means loss of the eye, but a very small puncture might not destroy the organ.

CANCER IN THE EYE—FUNGUS HAEMATODES.—This is the same as a cancerous growth that may develop on any part of the body; it is not common, and yet may appear in the eye.

Causes.—Unknown

Symptoms.—It frequently commences in the eyeball as a small, red mass, eventually bursts through, and pushes its way outside the orbit of the eye, as a large, spongy, fungus-like excrescence that bleeds upon the slightest injury, in fact upon the mere touch.

TREATMENT.—

When the exact nature of the case is known, the eye should be taken out. For removing the eye, the animal should be given an anaesthetic (see OPERATIONS, page 347). The after-treatment would be the same as for "Dislocation of the Eyeball." The operation should be left to the veterinarian. As these growths often return, unless the animal is valuable as a breeder, it best be fitted for the butcher.

DISLOCATION OF THE EYEBALL.—The eyeball may be torn out by the horns of another animal in a fight, or it may be crowded out with the blunt end of a club, cane, or probe, in the hands of some brutal person.

TREATMENT.—

When the optic nerve is not lacerated and the retractor muscles at the back of the eye are intact, an attempt to replace

the eye is advisable. This, however, must take place immediately after injury and before swelling takes place. Divide the outer corner of the eyelid to enlarge the orifice, then by pressure, with the fingers of both hands placed upon the sides of the eye, the ball may be put back in its place. Apply a firm compress over the injured eye and keep it constantly wet with cold water, containing 1 drachm of Sugar of Lead to each quart of water. If the attempt to replace is not a success, tie the artery at the back of the eye with strong cord, and then cut off the whole mass as deep within the orbit as possible. The cavity should be packed daily with fresh absorbent cotton, after washing it out with a 3 per cent. solution of Carbolic Acid.

INFLAMMATION AND ENLARGEMENT OF THE HAW.—The haw or membrana nictitans, that small structure at the inner angle of the eye, is subject to inflammation and swelling from the extension of conjunctivitis or ophthalmia, or direct injury by foreign substances. It presents a red, swollen appearance, accompanied by considerable pain and a profuse flow of tears.

TREATMENT.—

The application of cold fomentations and the lotions as used in "Ophthalmia" will generally reduce the swelling and restore it to its normal function.

There is, however, a tendency for an inflammation of this membrane to take on a chronic character, which may result in a permanent enlargement, resembling a tumor. When it attains sufficient size to protude itself permanently over the eye, or project between the lids so as to obstruct the sight, its removal may become necessary. A threaded needle is passed through the body of the enlarged mass by which the membrane is drawn out as far as possible, then with a blunt pair of scissors, it may be cut away from its attachments. Use the Cocaine solution to destroy the pain, by dropping 15 to 20 drops of it into the eye ten or fifteen minutes before operating (see OPERATIONS, page 347).

DISEASES OF THE EAR

INFLAMMATION OF THE INTERNAL EAR—OTITIS.—Inflammation of the deep part of the ear is often difficult to recognize in cattle.

Causes.—May be caused by the disease of the bone of that region, from blows inflicted by drivers, or from injury by other cattle. Occasionally it may arise from extension in "lump jaw," or be the result of tuberculous affection.

Symptoms.—Animal will hold its head to one side, or shake it, while the ear is held immovable. The movement of the jaws in eating gives evident pain; the base of the ear may be feverish and swollen, and very sensitive to the touch. If the inflammation has advanced to a suppurative stage, matter will flow from the ear, and the discharge will generally be offensive in odor.

TREATMENT.—

At first apply hot fomentations to reduce pain and fever, and follow with a sharp blister applied below the ear. To relieve pain and soften secretions, the following may be injected into the ear:

Laudanum	1 part.
Olive Oil	10 parts.

If there is a discharge from the ear, it should be thoroughly washed out by injections of warm soapsuds until clean, then inject a little of the following mixture twice a day:

Sulphate of Morphia	20 grains.
Water	1 pint.
Glycerine	4 ounces.

Injections of a solution of Acetate of Lead, ½ ounce; water, 1 pint, may help in some cases.

ABSCESS OF THE EAR.—Abscesses sometimes form about the base of the ear, either inside or outside, caused by contusions. Cysts or pouches, containing a watery fluid, are found occasionally between the cartilage and the skin on the base of the ear, which may be due to similar cause.

TREATMENT.—

Make a free incision with the knife into the most prominent part of the abscess or cyst, then wash out the sac with the Carbolic Acid lotion, using a syringe for the purpose. If the abscess recurs, open it again, wash it out, and inject a little Tincture of Iodine.

FOREIGN BODIES IN THE EAR.—Bugs have been known to gain access to the ear of an animal. Foreign bodies of various sorts may become lodged in the ear.

Symptoms.—A continuous uneasiness or frequent shaking of of the head; occasionally manifestations of severe pain. Animal may rub head and ear against trees and other objects, in endeavor to get rid of offending body.

TREATMENT.—

When suspected, catch the animal and examine the ear, and when object is found, remove the same with forceps, a hair pin, or with a piece of wire bent at one end. If inflammation exists and ear is swollen, so substance is hidden from sight, insert a probe to feel for object, and when found remove, even if necessary to split the ear at the base to do so. Afterward treat the ear with hot water fomentations, and injections of mild astringents, as Acetate of Lead, ½ ounce; water, 1 quart.

FROSTBITE—GELATIO.—This is not an uncommon occurrence among young cattle which are poorly fed and exposed outdoors to storms and extremes of cold; a condition, however, which ought never to occur.

Symptoms.—This affection naturally presents every degree of severity from the mere chilling of the tip of the ear to positive freezing and death of a portion. In a day or two the ear will become swollen and painful; the dead part will remain cold and begin to shrivel; a line of separation forms between the inflamed and dead, or dying, portion; and finally the dead piece drops off, leaving a raw surface. When only slightly chilled, there will be a peeling off of the superficial skin, accompanied by some pain and itching.

TREATMENT.—

A good liniment for frozen ears is:

Turpentine	1 ounce.
Ammonia	1 ounce.
Chloroform	1 "
Olive Oil	6 ounces.

Mix and rub the ears several times daily.

It will relieve pain, and stimulate circulation, thus favoring a recovery of the injured structures. If a portion of the ear sloughs, treat the resultant wound as an ordinary wound.

TORN OR LACERATED EARS.—Dogs are the most frequent cause of lacerated ears, generally leaving a torn, ragged edged and bruised cartilage.

TREATMENT.—

If the wound is extensive it will be necessary to trim off the ragged edges; then fasten the edges together with stitches of cat-gut, silk, or strong, thick, linen thread, taking a deep hold. Secure the animal so it cannot rub the part, and dress daily with the Carbolic Acid lotion.

DISEASE OF THE CARTILAGE OF THE EAR.—Sometimes the cartilages of the ear become affected, usually from a deep bruise; pus forms, which burrows under the skin, and may find outlet at some point more or less distant from seat of trouble. When cartilage has been extensively injured, pieces of it become dead and dissolve, and are carried away in the pus, or it may lead to sloughing and the formation of many running sores. In this affection there is seldom much swelling or great pain. Discharge is usually offensive and often blood-streaked. Whenever there is long-continued discharge from one or more openings in the ear, this disease may be suspected.

TREATMENT.—

The sinus formed by the passage of matter should be probed and searched to the bottom for the presence of foreign substance or evidences of decaying cartilage. When probe touches decaying cartilage it will feel like a piece of dry leather

or partially softened wood. A counter-opening must then be made at this place and all diseased cartilage cut away with a knife. After this keep wound open for the pus to discharge, and inject into it once or twice a day, until the wound is healed, the following solution:

Acetate of Lead	1 ounce.
Sulphate of Zinc	½ ounce.
Carbolic Acid	½ ounce.
Water to make	1 pint.

Shake.

FRACTURED BONES; WOUNDS; SPRAINS OF JOINTS AND TENDONS

FRACTURED BONES.—A fracture is a break in a bone. It may occur in a variety of ways; the kick of a horse, getting caught in the fence while jumping, falling, being chased by dogs, by being hit by anything hard enough to cause a fracture. As a rule, fractures are more easily repaired in cattle than in horses, owing to their being more quiet. Fractures are classed as transverse, oblique, "green-stick," simple, compound and complex. In transverse fracture the bone is broken across; in oblique, slanting; in "green-stick," it is bent and split but not broken entirely off. In simple fracture, only the bone is broken without complications; in compound, the ends of the bones punch through the flesh and protrude; in complex, the bone is shattered into many small pieces. As a rule, when the fracture is so bad that the bone is shattered, or a piece of the bone protrudes through the skin, it is best to slaughter the animal. If the condition of the animal is otherwise healthy, if slaughtered at once, the meat is fit for food, and the loss is not so great. When the care and expense of treatment is considered, this is probably the best disposition of these cases, except, perhaps, where the animal is valuable for breeding purposes.

FRACTURE OF THE LOWER JAW.—This is a fracture that generally occurs from a kick or a blow of some kind, and is first noticed by the animal not being able to eat, the mouth seeming crooked, and by the bloody discharges from the mouth.

TREATMENT.—

If any other than a simple, transverse fracture of one side only, the animal may as well be destroyed; if simple, put the ends of the bone together, and hold them there if possible, by passing copper wire around the teeth; in order to do this it may be necessary to cut through the cheek, opposite the fracture. Feed on soft and sloppy food until recovery takes place. Flush out the mouth freely after each feeding to remove any particles of food which might interfere with the uniting of the bones. Later, the wire can be removed through the mouth, or the cheek again opened

FRACTURE OF THE BONES OF THE NECK AND BACK.—If the fracture should be through the body of the bone, there is likely to be pressure on, or laceration of the spinal cord, causing paralysis to parts back of the injury. Fracture of the spines of the vertebrae occur, without interfering with the canal containing the spinal cord. Such accidents may pass unnoticed, for though animal may suffer pain, it is not likely to be shown in a way to attract attention, and the deep muscular covering hides the injury. When a fracture occurs in the upper part of neck, the muscles of breathing are paralyzed, and death by suffocation soon follows. The more common seat of fracture is in the loins, and when a fracture of the body of the vertebrae occurs here, paralysis of the hind legs and quarters results. Diagnosis of such an accident is more difficult than in the case of other fractures. The parts can not be moved one upon another, so that crepitation (grinding) is not noticable. The heavy coating of muscles conceals changes that might otherwise attract attention. About the only symptom is paralysis of nerves of motion and sensation, back of the seat of the injury, which careful examination may reveal. If the result of a blow, there is apt to be abrasion of the skin. If paralysis is present, and the irregularity of the spinal column is so marked as to leave no

room for doubt, the only thing to do is to destroy the animal. If, on the other and, the paralysis is incomplete, with no evidence of irregularity in spinal colum, or other evidence of fracture, put the animal in a well-bedded box stall, and allow a few days to pass before the case is abandoned.

The symptoms last described might result from a strain of the muscles of the loins, in which case an improvement will soon be noticed. In which case treat as for strains.

FRACTURE OF THE BONES OF THE HIP—HIPPED.—This accident is likely to occur as the result of crowding when running through a narrow door, falling violently on the point of the hip, or from a blow directed downward and forward against it. The fracture is not dangerous, but it disfigures the animal. The animal is lame at first, but this symptom will disappear.

TREATMENT.—

If sore after being "knocked down," bathe twice a day in hot water, and apply the White Lotion (see page 263) until the soreness is out. If the bones heal all right there is nothing more to be done. Sometimes the bones do not unite, and it will soon begin to fester around the broken piece and an abscess will form. When the abscess is formed, open and remove the piece of bone, and treat as under "Abscesses." Fracture of the under part of the hip bones, the floor of the pelvis, generally occur from the animal slipping on the ice with legs spread apart. As soon as it gets up, it walks off stiffly and the legs are kept out apart while either walking or standing. The treatment for this is to keep animal very quiet, by tying it in a stall until the bones unite—from four to five weeks.

FRACTURE OF THE RIBS.—This is always the result of a kick or a blow of some kind. The ribs farthest back are the most liable to injury.

Symptoms.—Pain in moving, slight swelling over seat of injury, and difficult breathing are evident symptoms. If the fracture be complete the grinding of the bones may be noticed by placing the hand flat over the injury, noting carefully the

motion as chest contracts and expands in breathing. This symptom is more noticeable when animal coughs. In slight cases the animal can get up and down, but in severe cases may remain lying.

TREATMENT.—

Unless the point of the broken bone penetrates the chest cavity, no treatment is required other than quiet, good care and food. For a few days the animal should be restricted in the amount of food and water, the stomach being kept as nearly empty as possible. Sloppy food should be given, to encourage as much as possible the free action of the diaphragm in breathing, If breathing is labored and attended with much pain, motion may be limited by applying a wide bandage firmly around the chest. If the animal remains down, turn it over from side to side three times a day. If point of rib penetrates the lung and sets up inflammation, there is little chance of recovery.

FRACTURE OF THE SHOULDER BLADE OR SHOULDER BONE.—Fracture of these bones is indicated by the extreme lameness it produces, and on moving the leg the grating of the bones may be heard. In a case of this kind it is best to destroy the animal, unless a very simple fracture and the animal is a young one, in which case keep it very quiet and give good care ; time will do the rest. The less the fracture is worked over, the better.

FRACTURE OF THE BONES BELOW THE KNEE AND HOCK.—

Symptoms.—There will be crookedness of the leg, lameness and extreme pain, and when leg is moved the grating of the bones on one another will be heard.

TREATMENT.—

Put the animal in a quiet, roomy, well-bedded place, set the leg in shape, and have it held while bandaging it with a starched bandage, which is a long strip of cloth dipped in starch used for starching clothes. When drawing strip from the starch, draw it between the fingers to get off as much as possible, then wrap

it moderately tight around the leg, using plenty of bandage, and have leg and bandage held in one position for an hour or more for bandage to harden. Thin wooden splints, or thick leather ones, can be used in connection with the starch bandage. After this, the bandage will hold leg in shape. Leave it on four or five weeks until the bones heal. Keep animal quiet until the bones are well knit together. If leg should swell with the bandage, take it off and put on a looser one. The Plaster Paris bandage may be used in place of the starch (see HORSE DEPARTMENT).

Fractures above the knee are sometimes treated by this method but it is not nearly so successful. Cattle cannot be put in a sling as can horses. They are less nervous and will keep quieter than the horse, however, and treatment is fairly successful if the fracture is a simple one.

FRACTURE OF THE BONES ABOVE AND BELOW THE STIFLE JOINT.—

Symptoms.—Animal may not be able to stand, but if so, the leg will be hanging loose. By moving the leg one can hear the broken bones grate upon each other.

TREATMENT.—

In severe cases it is best to destroy the animal; if fat, kill it for beef. When above the stifle, the only thing that can well be done is to keep the animal quiet, and leave lying down or standing, as it prefers. If below the stifle, down quite close to the hock, the bone can be set the same as when below the hock.

STIFLE OUT IN CATTLE.—For this disease the reader is referred to article in the HORSE DEPARTMENT, the causes, symptoms, and treatment being the same.

SPAVIN IN CATTLE.—This is generally seen in working oxen, or cows. There is lameness and enlargement on the inner side of the lower part of the hock joint, similar to spavin in horses.

TREATMENT.—

Blister the same as recommended for "Spavin" in the horse.

SPRAINS.—A sprain is an injury to the joint, caused by violence, which produces more or less injury to the ligaments binding the joints together and to the soft tissues of the joints. It is usually caused by twisting or bending the joint in an unusual direction.

Symptoms.—If severe, lameness usually comes on at once; joint becomes inflamed, swollen, and tender, and is moved with much difficulty.

TREATMENT.—

Animal should be kept quiet. If there is severe pain, apply fomentations of hot water to soothe and relax the parts. When there is severe and persistent inflammation, cold applications in the form of water or ice bags are beneficial. When inflammation subsides, if lameness and swelling persists, apply the White Liniment (see PRESCRIPTIONS, in the back of book), well rubbed in, three times a day. In some cases a light blister will hasten recovery. If sprain is in the joint of the legs, the legs may be bandaged each time after bathing; this will relieve pain and support the joint. A part that has been severely sprained should have a long period of rest, as recovery from sprain is slow. For sprains of any particular region, see discussion for the same in HORSE DEPARTMENT.

WOUNDS OF ALL KINDS.—For treatment of wounds, see HORSE DEPARTMENT (page 262). Causes and treatment are essentially the same.

AIR UNDER THE SKIN CAUSED BY A WOUND.—Sometimes from a very small wound in cattle, air gets under the skin into the tissues which connect the skin to the body. The amount of air varies greatly; sometimes only a small amount works in just around the wound, while in other cases quite large amounts may be drawn in, enlarging the part very much. In order to make sure that it is air, rub the hand over the skin and it will make a peculiar crackling noise. Tapping on the skin with the fingers produces a drum-like sound.

TREATMENT.—

Puncture the distended skin with a broad-bladed knife and let out the air. Treat the wound thus inflicted as an ordinary wound; or, if possible, work the air out through the opening through which it entered. Keep the animal quiet, to prevent its collecting again, as movements have much to do with the air working in.

MAGGOTS IN NEGLECTED WOUNDS; SCREW-WORMS IN WOUNDS.—No thrifty farmer, or stockman, should, if possible, allow such a condition to occur. But if from oversight, or other circumstance, such a case exists, the wound should be thoroughly cleansed with soapy water, and maggots removed; then apply a Carbolic Acid lotion—Carbolic Acid, 6 drachms; water, 1 pint; or, Creolin, 1 ounce; water, 1 pint. If case is so bad that this does not effect a cure, give the wound a good application of Spirits of Turpentine, and follow as at first twice a day.

In some sections screw-worms, the larva of the screw-fly, are a great pest, causing serious loss to live stock. They attack even the smallest wounds, as tick bites, wire cuts, and the like. For these, inject into the wound with a machinist's oil can, a strong Creolin solution, or Kerosene, or Turpentine. Oil of Tar is also good. Protect fresh wounds with Tar.

WENS RESULTING FROM WOUNDS AND BLOWS.—These are hard, fibrous bunches, or tumors, frequently seen on the ribs, legs, and jaws. Are seen mostly on oxen.

TREATMENT.—

If noticed when first started, foment them with hot water several times a day; after a few days, the soreness being partly out, use Iodine Ointment (see PRESCRIPTIONS, in back of book) once a day. If, however, they have become large and hard, nothing will be of any use short of cutting them off. This may be done without danger. (See "Tumors," in HORSE DEPARTMENT). Afterward dress the wound with a 3 per cent. solution of Carbolic Acid.

DISEASES OF THE SKIN

ECZEMA, ACUTE AND CHRONIC.—Eczema is an inflammation of the skin, associated with small blisters. The disease may run an acute course and disappear, or it may become chronic.

Causes.—Filthiness and lousiness, over-feeding, excessively damp or too warm quarters are conducive to this disease. Cattle fed on sour substances, distillery slops, house or garden garbage, may develop the affection.

Symptoms.—There is swelling and heat of the skin; little blisters form, containing a watery fluid; these break and discharge, dry up and heal, but while these are healing, a new crop breaks out in another place. From the beginning, animal will rub the affected parts, and disease is not always easy to recognize, as the rubbing will abrade the skin and leave surface raw—sometimes bleeding. In some cases the discharge will be profuse and disease will be spread over a large surface. At other times the formation of crust or rawness of skin will be a striking feature.

TREATMENT.—

If animal is fed too high, give an active purgative once a week—1 to 1½ pounds of Epsom Salts—and give in the feed, twice a day, ½ ounce of Saltpeter. If the animal is in poor condition, give the tonics as recommended for "Chronic Indigestion," along with occasional doses of Epsom Salts.

If animal is lousy, lice must be destroyed before eczema can be cured. Much washing is harmful, yet crusts and scales must be removed to make external applications effective. In the blister stage, when skin is hot and outer part peeling off, exposing raw surface, apply the following solution:

Boracic Acid	¼ ounce.
Water	8 ounces.

Or:

Acetate of Lead	½ ounce.
Water	1 pint.

GIVING THE COW MEDICINE.

See page 542.

This will often relieve the smarting or itching, and serve to stop exudation and dry the surface. Alternating with the foregoing can be used:

Creolin	1 ounce.
Water	1 quart.

These may be used several times a day until a healthy scab is well established. Then use:

Creolin	1 ounce.
Sweet Oil	1 pint.

Or the Benzoated Oxide of Zinc Ointment (see PRESCRIPTIONS in back of book), giving affected surfaces a thorough application once a day. Remove cause and feed moderately on such as green food, bran mashes, ground oats, clean hay, and plenty of salt.

In chronic cases the treatment will need be prolonged and the internal treatment given especial emphasis, along with applications to the diseased parts of some softening ointment, as the one mentioned above.

ERYSIPELAS.—This is a diffuse inflammation of the skin, sometimes spreading to the deeper tissues and causing much pain and irritative fever. It may be transmitted to other animals or to man, by direct inoculation through a wound, or by infected instruments, but it is not contagious in the true sense of the term.

Cause.—The cause is due to a certain class of germs that gain entrance through a wound, though this wound may be so minute as to escape notice.

Symptoms.—The skin is hot, tender and swollen, and if normally white, turns intensely red. Color does not disappear under pressure. The inflammation and swelling affect the deeper tissues, which have a "doughy" feeling and "pit" under pressure; there is a well-defined line between the healthy and diseased parts. In severe cases there is a tendency toward the formation of a brownish, bad-smelling pus under the skin, and extensive sloughing of the diseased tissues.

TREATMENT.—

If there is fever and the animal is fat, give a physic of 1 to 1½ pounds of Epsom Salts, and also use the following:

Fluid Extract Aconite	1½ drachms.
Fluid Extract Belladonna	1½ ounces.
Fluid Extract Colchicum Seed	1 ounce.
Saltpeter	3 ounces.
Water to make	1 pint.

Shake. *Dose*: 2 ounces, three times a day.

But, if, on the other hand, the animal is run down, withhold the Salts and give the following:

Tincture of Iron	6 drachms.
Quinine	1 ounce.
Water to make	1 pint.

Dose: 2 ounces, in ½ pint of water, three times a day.

In connection with the constitutional treatment, the affected parts should be wet frequently with one of the following mixtures, and covered with a cloth wet with the same:

Chloride of Iron	1 ounce.
Alcohol	½ pint.
Water	½ pint.

Or:

Sugar of Lead	1 ounce.
Water	1 pint.

Or:

Hyposulphite of Soda	4 to 6 ounces.
Water	1 pint.

When pus forms, the cavity should be opened and washed out twice daily with the following solution:

Corrosive Sublimate	15 grains.
Water	1 quart.

Or, with a 5 per cent. solution of Carbolic Acid:

Carbolic Acid	6 drachms.
Water	1 pint.

The serum treatment, as used with the human, could be tried in severe cases and where the value of the animal would warrant the expense. A veterinarian or a physician would be required to administer the serum.

LICE.—The lice of cattle are of two kinds—the blood-sucking lice and the biting lice. There are two varieties of the first, known as the long-nosed ox louse and the short-nosed ox louse. The short-nosed louse is the hardest to exterminate. It infests, almost exclusively, the neck and shoulders. The long-nosed louse is the most common. The biting louse, or bird louse, generally called "the little red louse," is very commonly found on cattle.

Symptoms.—Lousiness generally shows itself in winter and toward spring, when animal is found to rub infected parts of the body, sometimes so much so as to abrade the skin. It becomes thin in flesh and run down. A close examination will reveal the true condition, and prompt treatment should be given.

TREATMENT.—

This does not vary in the different species, though the short-nosed fellow is the hardest to kill. The following is recommended by Dr. W. H. Low: Take ½ pound of Cocculus Indicus for each animal, then add 2 quarts of vinegar, and set on the stove to simmer for one hour. Apply this by rubbing well into the hair over affected part. This will not affect the skin, nor sicken animal, and it remains effective long enough to kill all the young lice as they are hatched from the "nits." Kerosene Emulsion is very effective and is made as follows:

Kerosene Oil	2 gallons.
Common or Whale Oil Soap	1 pound.
Soft water	1 gallon.

Dissolve soap in water and add solution boiling hot to the Oil; then churn mixture from five to ten minutes, or until it is white and creamy-like and no free oil can be seen. Dilute Emulsion in 9 parts of water and apply it to the animal with a sponge or brush. Be careful that the animal does not catch cold.

The various Coal Tar products are also very effectual, as:

Creolin	1 ounce.
Water	1 quart.

Or:

Zenoleum, or Kreso	1 part.
Water	50 parts.

Apply the same as the Kerosene Emulsion.

With any of these a second application should be made in ten days or two weeks, as the applications do not destroy the eggs and these will have all hatched by that time, and none of the lice hatched will have matured and deposited eggs.

The mangers and stalls where the animals are kept, should receive an application with the same preparations as used on the cattle.

If the weather is such that the washes cannot be used, some benefit will be derived from liberally dusting Pyrethrum powder into the hair.

If the animal is run down, give tonics as for "Chronic Indigestion."

RING-WORM.—This is an affection of the skin due to a vegetable parasite, and is rather a common one in cattle. It is most frequent toward spring, after cattle have been confined in stable during the winter. It is sometimes called "barn-itch." It is not readily transmitted from one animal to another, but, under favorable conditions, it may be done.

Symptoms.—The disease may be recognized by circular patches, varying from one-half to several inches in diameter, from which the hair is fallen. These patches usually occur about the head, neck, or back. The skin from which the hair has fallen is slightly thickened and scaly, and patches, when incrusted, are of a silvery-gray color. Very early in disease the hairs split, twist, and break off close to the skin. There is more or less itching.

TREATMENT.—

Wash off crusts with soap and water, and apply Tincture of Iodine once a day for a few days to destroy the parasite. Turpentine, Kerosene, and a solution of 1 part of Carbolic Acid in 20 parts of Sweet Oil are all very good. Acetic Acid, Sulphur Ointment, or Nitrate of Mercury Ointment are also recommended. Cleanse stable, and whitewash, to destroy spores scattered by the crusts.

MANGE, OR SCAB, IN CATTLE.—Cattle scab, or itch, is caused by a mite very closely resembling that of the sheep scab. It is most common on the great cattle ranges of the west and southwest, and is commonly known there as the "cattle itch." This disease is not troublesome during the grazing season, but when cattle are on dry feed in winter, or when first turned to grass in the spring, the trouble exhibits itself, and may cause considerable loss. It is mostly confined to young cattle, and to those out of condition.

Symptoms.—The first symptom is an intense itching, usually in the region of the neck and shoulders, and at root of tail; animals lick themselves, bite and rub, using even barbed-wire fences for scratching, and tearing skin till it bleeds. From these localities disease gradually extends along back, sides, and down the outside of legs. In early stages the coat looks rough, and hair stands on end. The skin becomes scurfy, and a gummy exudation from it forms a crust in the hair sometimes a half inch in thickness. The hair then comes off, or is rubbed off, leaving patches of calloused, thickened and wrinkled skin. When the hair comes off, the mites leave, bald places heal, and hair starts again. Animals fall away rapidly in flesh, and have a dejected, debilitated look; appetite is poor.

The disease spreads rapidly, especially so if the general condition of the stock is not good, and in from six to eight weeks after the appearance of complaint, the herd will generally be affected. Thrifty animals resist disease longer, and recover more quickly when attacked. Disease is spread by direct contact, either from one to another, or through rubbing places. It is easy to confound this disease with eczema, and assurance depends on the discovery of the parasite. It may be seen on the hair, and scales from the skin, by the aid of an ordinary magnifying glass, or by the unaided eye, as minute, white points moving about, when animal stands in the full glare of sunlight on a warm day.

TREATMENT.—

As soon as disease is discovered, remove all animals not affected, to new places not occupied by diseased stock. If this is

not feasible, separate all animals and thoroughly disinfect all places where animals may have rubbed, by scrubbing with a solution made by dissolving 1 part of Carbolic Acid in 20 parts of water. Watch animals that appear healthy, and if any show signs of disease, separate from others at once. As an internal remedy, give Sulphur, in combination with salt, and place where animals can lick it at will. Mix in the proportion of:

Sulphur	1 pound.
Salt	8 pounds.

If cattle are not accustomed to eating salt, limit quantity to a small handful at first, and increase amount gradually. The external treatment consists of application of remedies to destroy parasites and eggs without injuring the animal. If many cattle are affected, the most satisfactory means of treating is by a dipping vat or swimming tank, in which the submerging of the stock destroys the parasites. Efficient remedies for external application are some of the Coal Tar products, such as Zenoleum or Kreso, which are used in the proportion of 1 part of the product to 50 parts of water. A very cheap and effective dip is the Lime and Sulphur dip, as recommended by the Department of Agriculture:

Flowers of Sulphur	21 pounds.
Unslaked Lime	16¾ "
Water	100 gallons.

Slake the Lime with water enough to form a thick paste, sift in the Sulphur and stir well. Put this mixture in a kettle with 25 to 30 gallons of water and boil two hours, or until the Sulphur disappears; then put in a barrel, with bunghole some four inches from the bottom, and allow the chocolate-looking mass to settle; draw off the clear liquid, adding enough water to make 100 gallons. All dips should be used warm—100 to 110 degrees. Keep animals in the dip about two minutes, or until the scabs are thoroughly saturated. A second dipping in about two weeks will kill any mites that may have hatched after the first dipping. If only a few animals are diseased, hand treatment may be resorted to, but it must be thoroughly done. The remedies may be

applied with scrubbing brushes, cloths, or sponges. All scabs and crusts must be thoroughly saturated, and remedy should be applied warm, as in dipping. Warm, sunny days should be chosen for treatment.

HORN FLY.—The horn fly—also called "Austrian fly"—is a small, black fly, about one-half the size of the common house fly, and of the same general shape. It was imported into America about 1887, and since then has spread all over the country. It causes considerable irritation and a consequent loss of milk. The name arises from the fact of their habit of collecting in numbers at the base of the horns to rest. They do not bother cattle when in this position, but by biting the skin of the back, sides, and flank. They appear with the first warm weather of spring and disappear with the first severe frost.

TREATMENT.—

Almost any greasy substance applied to the skin and horns will keep the flies away for several days, and must then be repeated. Common axle grease, Whale Oil, Carbolized Oil, or Tar may be used. A mixture of equal parts of Pine Tar and Kerosene Oil, and two parts of Fish Oil, or crude Cotton Seed Oil, is good; first "cut" the Tar with the Kerosene and then add the Fish Oil. The crude Kerosene is as good, or better, than the refined. Brush mixture over hair surface as often as is necessary. A wash of Creolin applied twice a week is also good. Make it by mixing and shaking together:

Creolin	2 ounces.
Water	1 gallon.

BUFFALO GNAT.—This is a small fly, common in the lower Mississippi Valley, that proves a great scourge to the cattle of that region. In color they are black, but are covered with grayish-brown, short, silken hairs. They are migratory, or are driven in swarms by the wind, and are found in localities remote from breeding places; in some instances as far north as Jackson County, Ill., and Daviess County, Ind. They appear each year with warm weather of spring, and duration in infested region

lasts, from a few days to five or six weeks. They are most lively in early morning, and when very numerous, cover cattle without regard to position. The bites of a few gnats will not affect an animal seriously, but when attacked by swarms, he weakens rapidly from loss of blood and shock, and may later die from exhaustion or blood-poisoning. When attacked, the animal "puts for the brush," or jumps into the water to get rid of them. The fatality is even greater among mules then cattle.

TREATMENT.—

Preventive treatment counts for much with the buffalo gnat. Smoke from fires built of wet wood, burning leather, Tar, rags, and the like, will keep them at a distance. As soon as gnats appear, build fire as above, making as much smoke as possible, drive cattle up to it, and they will stay while gnats are about. Stabling during the day and turning out late in the evening until early morning, is a reasonably safe measure to adopt. Cotton-seed Oil, mixed with Tar, Fish Oil, Kerosene, or Carbolic Acid, as for "Horn Fly," applied to cattle twice a day, will protect them to a great extent. When animal has been weakened by attack of gnats, give from ½ to 1 drachm of Carbonate of Ammonia, and 4 ounces of Whiskey, in ½ pint of water, every four hours and keep him in a dark, cool place. Occasional immersion in cold water has been beneficial.

GRUB IN THE SKIN — WARBLES.— Little round lumps or tumors will often be found along the backs of cattle during late winter and spring. These are called warbles and are lairs of the larvae of the ox gad-fly. When cattle are attacked by this fly it is easily known by the stir and commotion made. The unfortunate object of attack runs bellowing to some distant part of field or nearest water. Other animals scatter out of fear. The eggs of this fly are laid in the region of the heel, and are taken by licking, into the mouth, where they hatch, and the larvæ, after remaining some time in the gullet, finally work their way into the cellular tissue beneath the skin of the back. Here they remain until early spring, forming the lumps called "warbles." The loss from discomfort to cattle, and in consequence of "grub-by" hides, is great.

TREATMENT.—

Whenever cattle have these tumors, every warble should be treated from January on, by applying Turpentine, or even some thick grease, or a mixture of the two, to the opening directly over the lump. This will kill most of the warbles. The few that remain should be squeezed or picked out to prevent the development of a fly. To squeeze out, enlarge the opening leading through the skin, to them, with a small, blunt stick. If this plan were generally carried out, the fly could be exterminated. The gad fly does not travel far, so that a person by this means could rid his cattle of the pest.

SNAKE BITES.—There are several varieties of snakes in this country whose bite is poisonous, among the number being the rattlesnake, the cotton mouth, and a small snake of the south. On cattle, the bites are generally about the head, feet or limbs. Close inspection will generally reveal the marks where the fangs pierced the skin. When the poison has been freely injected into the wound, excessive pain is soon manifested, quickly followed by swelling; extreme prostration sets in and the animal may soon become partly unconscious; body gets cold, and pulse-beats faint; finally heart fails and death results. Usually, however, poison does not cause pain, but recovery from effects of it is slow. Abscesses and sloughs may form, requiring a long time to heal, or death from exhaustion may result.

TREATMENT.—

Give Whiskey in ½-pint doses every thirty minutes to an hour, until it arouses sinking vitality. Aqua Ammonia in 1-ounce doses, diluted in 2 quarts of water, may be used instead of Whiskey. External treatment should consist in cauterization of wound by plunging a red-hot iron into the wound as deeply as the location of the wound will permit. Cut gashes in the skin over the swollen part, to drain the blood away and lessen the danger of sloughing. Afterwards keep parts well painted with Tincture of Ionine.

BITES AND STINGS OF INSECTS.—These may be inflicted by tarantulas, scorpions, wasps, bats, hornets, and the

like. Occasionally an animal may be stung by wasp or bumble-bee, and, owing to condition of the blood, the injured skin will swell and form a painful enlargement. If stung by a swarm of bees, prostration and sickness may follow.

TREATMENT.—

Apply a lotion made by dissolving 2 drachms Sugar of Lead in a pint of water, which will usually relieve the pain and swelling. An ounce or two of Laudanum may be added if pain is severe. Lotions of Cooking Soda, or Ammonia, or of Carbolic Acid, will also be found good. The White Liniment (see PRESCRIPTIONS, in the back of book) will also be found beneficial in drawing out the poison. If there is prostration, give 1 or 2-ounce doses of Alcohol in ½ pint of water, repeating as occasion requires.

BURNS AND SCALDS.—For burns, an excellent remedy for cattle and all domestic animals—man included—is what is called Carron Oil, being composed of Linseed Oil and Lime water in equal parts. Shake, and apply. Common white paint is also a good remedy. If not convenient to get this, Cooking Soda, Flour, or Starch may be spread on the wound dry, and covered with cotton batting and a light bandage, if possible.

For scalds, the surface may be bathed with a solution of Baking Soda, or a weak solution of Sugar of Lead—1 drachm to a pint of water—may be used. The dry treatment, or Lime water, as in burns, may also be used; or instead, Oil of Turpentine may be applied over the scalded skin.

For either burns or scalds, a dressing may be used as follows:

Carbolic Acid	½ teaspoonful.
Sweet Oil	4 ounces.

Blisters should be opened to let fluid escape, but the thin cuticle raised by blister should be allowed to remain.

WARTS AND SMALL GROWTHS ON THE SKIN.—Warts are tumors of the skin. They may be found on any domestic animal, but are more common in horses and cattle than among other animals. The cause of warts is not clearly known, though an abnormal nutrition of the skin is the explanation generally given.

TREATMENT.—

In their early stages, warts can be destroyed by an application of pure Acetic Acid, applying it drop by drop until the wart is saturated and soft. In a week or ten days the wart will come off. Should it not come "by the roots," make another application. A good way, in case warts have a neck, is to tie a string firmly around the base of the wart, which will soon slough off. If there is no neck, cut off with a sharp knife and cauterize the wound with a stick of Lunar Caustic or a hot iron. Small lumps and tumors in the skin are somewhat common to cattle, but are easy to get rid of. Have the cow held securely, then cut a hole in the skin over the lump, dissect it out and cut it off at the bottom. There is not much danger of bleeding so long as no large veins are cut, which can be seen in the skin. After removing, apply White Lotion twice a day. (See PRESCRIPTIONS, in the back of book.)

TUMORS.—Tumors are abnormal growths of tissue. There are many kinds, named usually according to the kind of tissue of which they are composed. Warts are tumors of the skin. Sore tumors that tend to spread and do not yield to treatment are known as malignant tumors. The cause of many tumors is not known. Fibrous tumors are sometimes caused by irritation, such as a repeated hitting of the part. Tumors may sometimes follow surgical operations, or wounds.

TREATMENT.—

The only satisfactory treatment for tumors is their removal. For doing this there are several methods employed. The best one for most tumors, and for some the only one, is to cut them out with the knife. Care should be taken to guard against hemorrhage, as the supply of blood to some tumors is large. (See "Tumors," HORSE DEPARTMENT.) Another method that can be used to advantage when the growth has a small base or neck, is to tie a strong cord tightly around the neck, or wind a rubber band several times around it, thus shutting off the blood supply. In a few days the tumor will slough off and the resulting sore can be treated as a simple wound. Still another way is

to use caustics. Arsenic, or Corrosive Sublimate, are commonly used, both singly or combined. A pellet of the caustic about the size of a small pea, wrapped in tissue paper, or muslin, is pushed into a small incision made in the base of the tumor. If the tumor is large, two or three pellets are often used. In a few days the tumor will begin to separate, and will finally slough off. The difficulty in using caustics is to confine their action to the diseased tissue. The least painful and most satisfactory way is to remove by dissecting, using the Cocaine solution as a local anaesthetic. (See OPERATIONS, HORSE DEPARTMENT). With small tumors, the repeated use of Iodine Ointment may remove them. (See PRESCRIPTIONS, in the back of book.)

DISEASES OF THE FEET

FOUNDER—LAMINITIS.—This is an inflammation of the sensitive structures of the foot, or what is commonly called the "quick." Owing to the simplicity of the structure of the foot of the ox, as compared with that of the horse, the disease is rarely seen in an acute form, but a mild form, commonly called "soreness," is a more common occurrence.

Causes.—Overfeeding, overheating, or being driven for long distances over rough, stony soil. In the cow it sometimes follows parturition.

Symptoms.—Animal persists in lying down most of the time, but when standing, front feet are well out in front of her, hind feet drawn forward under her; the feet are hot and sometimes swollen around the top of the hoof and sore to touch; there is more or less fever, the pulse is accelerated, and breathing is quickened; will drink greedily, but there is not much appetite. When forced to move, excessive tenderness of the feet is manifest by the short, stilty steps. The disease is most apt to affect the front feet, but may affect all four, When all four are affected, the front ones will not be put out forward to the same extent.

TREATMENT.—

Keep animal as quiet as possible and foment the feet with cold water, by tying blankets about them and keeping these wet with cold water, re-applying the water every half hour, or, have the animal stand in a shallow tank of water. Give animal a dose of Epsom Salts—1 to 1½ pounds in a quart or two of water, and also give a tablespoonful of Saltpeter three times a day, and in bad cases give with this a teaspoonful of Fluid Extract of Belladonna and 10 drops of Fluid Extract of Aconite. If the animal can stand in a stream of running water having a soft bottom a few hours a day, this will take the place of the fomentations.

Soreness of the Feet from any Cause may be treated the same as "Founder," and by keeping the animal quiet. If toes are too long, cut off with mallet and chisel.

LOSS OF HOOF.— Cattle sometimes become fastened between planks, or otherwise, in such a way as to pull off one or both claws in the effort to extricate themselves; or the claws of one or more feet may be shed as the result of founder.

TREATMENT.—

Apply a thick coating of Pine Tar over the bleeding surface, then cover with a layer of oakum or absorbent cotton; apply another coat of Tar over this, and then bandage closely and firmly. This may remain without redressing till new wall is strong enough to bear weight of animal. If at any time pus should form under dressing, as increased pain, and an oozing, or a bad odor will indicate, remove bandage and redress all the unhealthy surfaces with White Lotion (see page 263), and a Carbolic Acid lotion, and then apply a light dressing of Tar and cotton batting, and bandage. Repeat every day as long as there is pus formation. If loss of hoof is due to suppurative laminitis, the raw surface must be thoroughly cleansed, and disinfected with the foregoing lotions. Then apply a moderately thick layer of cotton and apply the Tar, and bandage over this. After this, the solutions may be poured in at the top of the bandage daily. It may be necessary sometimes to remove whole dressing once a

week, to give the parts a fresh cleaning, and then to re-apply it. In all cases, where it can be avoided, the first dressing should not be removed entirely, but holes may be made through it for the escape of the pus, and the application of the lotions.

FOUL IN THE FOOT—FOOT ROT.—This is inflammation of the foot between the claws or toes, and in some cases the inflammation extends around the bulb of the heels and also around the coronet.

Causes.—From overgrowth of the claws and inward pressure of the same, as in ingrowing nail in man; from the irritation of stable filth; or to foreign substances becoming wedged in between the toes. This disease is most commonly seen on the hind feet, though all four may be affected. It is not contagious, as in sheep, although a number of animals exposed to the same conditions may develop the disease.

Symptoms.—The animal is observed to limp in walking. On examining the feet, there is found fever and swelling above the hoof, and of the soft parts between the claws, which frequently spreads the toes apart to a considerable extent, or the inflammation may have advanced to softening and sloughing of the soft parts between the toes. If disease is neglected at this stage, deep abscesses may form and the pus burrow under the horny wall, or the joint within the foot may become inflamed, in which case the treatment is difficult and recovery tedious.

TREATMENT.—

In the early stages, before the pus burrows beneath the horn, thoroughly cleanse the part and apply a 3 per cent. Carbolic Acid lotion and also the White Lotion (see PRESCRIPTIONS, in back of book), and then foment in cold water, as in "Founder," also treat internally as for "Founder." Feed on laxative diet, and give clean, dry stable. If deep sloughing has taken place, the Carbolic solution should be used the same, and a wad of oakum or cotton, smeared with Pine Tar, should be firmly secured in the cleft. This can be done by taking a strip of strong cloth, two inches wide, passing the middle between the toes, then tying the ends, after winding them in opposite directions, above

the hoof. Sometimes warm poulticing with Linseed meal, boiled carrots, or boiled, mashed potatoes, can be used in place of fomenting. If pus burrows under the horn, its channel must be followed by paring away the horn, until the bottom is reached. Then treat as already recommended. If the joint has become inflamed, the animal should be placed in a shallow tank of water and the other treatment continued. If the animal does not take kindly to the fomenting or poulticing, stand him with the affected feet in a shallow tank of water, containing 4 ounces of Acetate of Lead and 4 ounces of Carbolic Acid to each pailful of water used. Keep the water cold by adding a little ice occasionally.

PRICKS AND WOUNDS; FISTULA OF THE FOOT.—If an animal suffers from a penetrating wound from prick of fork or nail, the orifice of the wound should be enlarged to allow a free discharge of pus; then apply a Linseed meal poultice, changing it three time a day until the fever has abated, and flush out the wound with the Carbolic Acid lotion. Keep animal on a clean floor until all lameness has gone.

If an animal is cut in the foot with barbed wire, glass, or any other substance, dress the wound, after careful cleansing with Carbolic solution:

Carbolic Acid	6 drachms.
Water	1 pint.

If any uneven edges of horn or skin, or of torn flesh project, trim them off and apply, where possible, a tarred bandage. This will hold parts in place, keep out flies, and exclude dirt. When the wound has extended into a joint, surgical treatment may be needed, and a veterinarian should be called. Sometimes, by foot getting caught in a crevice, it gets bruised, wrenched, or some part of the foot is fractured. In such a case apply cold-water blankets to the part until the fever and swelling disappear; after which allow the animal rest until the foot is strong. Unless complications arise, this will be all the treatment needed.

In case the wound becomes fistulous, which will be known by lameness, and discharge from a small opening, which shows no tendency to heal; pare out the horn around the sore spot, so

as to allow a free discharge of contents, and inject the Carbolic Acid lotion; then poultice with hot Linseed meal until the offending substance is removed. After this is out, the wound will heal without further trouble. With these wounds, standing in the shallow tank, as for "Founder" or "Foul," may prove a very effectual treatment.

DISEASES OF THE NERVOUS SYSTEM

APOPLEXY; CONGESTION OF THE BRAIN.— Apoplexy is the rupture of a blood vessel in the brain; congestion is the abnormal flow of blood to the vessels of the brain.

Causes.—It may be due to degeneration and consequent rupture of a blood vessel in the brain, the alarming symptoms being due to the pressure of blood upon the nerve substance. Fat, full-blooded cattle are most likely to be affected with disease.

Symptoms. — Attack is sudden, animal generally falls as though hit with an ax; convulsions similar to those described in encephalitis may ensue, or may be both unconscious and motionless; the eyes are open and blindly staring, mouth frothy, and body cold; breathing is loud or snoring, pulse frequent and small. Symptoms may moderate, but continued escape of blood causes death. In the case of plethoric cattle, in hot weather, symptoms are similar but milder; animal may at first be dull, staggering, and fall only to the knees, the muzzle resting on the ground.

TREATMENT.—

Cold applications should be applied to the head, in the form of cold, wet blankets, or better, ice poultices, and the general treatment, as in "Encephalitis, or Inflammation of the Brain," is indicated. If simple congestion, the animal will recover in a comparatively short time; if apoplexy, it is more serious, and treatment may fail.

CONCUSSION OF THE BRAIN.—

Causes.—From striking the head on some hard object while running, or from falling on the head. The injury may fracture the cranium and cause compression (pressing together) of the brain.

Symptoms.—These vary with severity of injury. Animal may lie prostrate and unconscious, with loss of sensation and power; if there are slight convulsive movements, they are without effort of the will. Death may follow injury; or if blow was not serious, recovery follow in a short time; or animal may remain unconscious, or may partially recover and encephalitis result in a few days. The injury may not only cause concussion, but at the same time may fracture one or more bones of the cranium; this may be simple—a crack in the bone without depression, or broken bone may be depressed, pressing on the brain, producing what is called compression of the brain. Compression of the brain may also follow injury without fracture, where there is a ruptured blood vessel, the escaped blood pressing on the brain substance. Or the injury may cause inflammation, and compression be due to pus formation. Compression, when due to escape of blood, may be suspected when insensibility continues. When from pus formation, the animal partially recovers, but after three or four days becomes unconscious again.

TREATMENT.—

If there is fracture with depression of bone, the part must be elevated, which in some cases may be done with a strong piece of steel, like a knife-blade. In many cases it is necessary to remove a portion of the bone in order to be able to raise the depressed part, but such cases call for expert treatment, and if a veterinarian is not immediately at hand, and the animal not a very valuable one, it should be butchered as soon as possible after accident, before the meat is unfit for use.

In concussion of the brain, during the first stages, when the surface of the body is cold, cover body and legs with warm blankets. It is useless to try to give medicine while animal is insensible. Cold water, or crushed ice, should be applied to the head, and when consciousness returns give the purgative drench,

as in "Encephalitis." Assist the animal to its feet, put in a comfortable place, free from noise and light. Only small amounts of food, in the form of bran slops, or freshly cut grass, should be given for some time. As a preventive against "Encephalitis," which is very apt to result from injuries of this kind, give the general treatment for that disorder.

INFLAMMATION OF THE BRAIN—ENCEPHALITIS.—Inflammation of the brain and its membranes, is technically called "Encephalitis," but owing to various symptoms, which, no doubt, depend on the particular part affected, disease is known by a variety of names, as "staggers," "stomach staggers," "mad staggers," "sleepy staggers," and the like. Inflammation of the brain without involving membranes, is so rare, and the possibility of distinguishing it by symptoms so remote, that it will be included in this treatment.

Causes.—May be caused by blows, or injuries to the head; by irritation from tumors of the brain; or, food containing ergot or other fungus growth, may cause the affection. In some localities certain plants have the reputation of causing the affection, as, for example, the Atamasco lily is called "stagger grass."

Symptoms.—These vary much; but a careful observer will notice trouble with nervous system. First signs may be those of frenzy, but generally at the start the animal is dull and sleepy, and may stand with head pressed against a wall or fence with legs kept moving as though animal were trying to walk through an obstruction; or the body, especially the hind part, may be leaned against side of stall or stable, as if for support. Bowels are constipated and urine scanty and dark colored. There may be trembling and spasms of muscles in different parts. In dull stage, breathing is slower than normal, and there may be snoring; pulse large and less frequent. If aroused, animal acts startled and stares wildly. The gait is staggering. When delirium ensues animal is said to be mad; it bellows, stamps the feet, runs about wildly, grates the teeth and froths at the mouth. If confined, it rears and plunges, and fits are so violent that it is often dangerous to offer aid. May be wet with sweat; fall; muscles

twitch and jerk ; often head is raised and dashed to ground until nose and mouth bleed. Eyes may be blood-shot ; limbs straight and stiff, or may be kicked about recklessly ; head may be drawn back, or to one side ; urine may come in jets ; often the haw is drawn over the eye. Convulsions may be succeeded by a more or less prolonged stupor, and animal regains senses, gets on its feet and perhaps eats, while at other times it gets up with difficulty and staggers blindly about the stall or field. The above symptoms are not all present in one case. In those cases called "sleepy staggers," the general symptoms of drowsiness are shown, while in other cases the frenzy symptoms cause affection to be called "mad staggers." In other cases, when the spinal cord and its membranes are involved, there are, in addition, symptoms of paralysis, swaying of hindquarters, inability to rise, etc. The various symptoms increase in frequency and violence until they end in death, which usually results from an attack of Encephalitis in cattle. When disease follows injury to head, symptoms usually do not follow for two or three days.

TREATMENT.—

To be of any use, treatment must be prompt. Give a good purgative; to a cow of average size the following:

Epsom Salts	1½ pounds.
Pulverized Gamboge	½ ounce.
Warm water	3 quarts.

Mix all together and give as a drench.

In addition, inject into the rectum about two quarts of warm water, or warm soapsuds, every three or four hours. Keep animal quiet; give plenty of cold water, but no food except bran slops in small quantities, and freshly cut grass, if in season.

During convulsions, give quieting drugs—1-ounce doses of Bromide of Potash, along with 1-drachm doses of Fluid Extract of Belladonna, every three or four hours, and a tablespoonful of Saltpeter three times a day; keep animal from injuring itself; hold head to the ground and have plenty of straw under it. Cold water should be continuously applied to the head, or ice-bags used on the head.

If the animal is dull instead of delirious, do not give the Bromide of Potash, but instead give the following.

Fluid Extract of Belladonna	2 ounces.
Fluid Extract Colchicum Seed	1½ "
Alcohol	8 "
Saltpeter	3 "
Water, to make	1 pint.

Dose: 1 ounce, five or six times a day. Give very carefully, or animal will choke.

Continue the ice poultices to the head. Mustard paste is sometimes applied along the spine and may be of some value. After two or three days, if the animal shows some improvement, give the following, alternating the doses with those of the foregoing:

Iodide of Potash	6 drachms.
Fluid Extract of Digitalis	½ ounce.
Water to make	1 pint.

Dose: 2 ounces, three times a day.

PARALYSIS.—Paralysis is a loss of voluntary motion. Its most common forms are better known under the names of paraplegia and hemiplegia. In the former, the whole fore or hind parts are affected; in the latter case, one side of the body only is affected.

Causes.—May be due to concussion of the spine; fracture of a bone of the spinal column; concussion of the brain; compression of the brain. An injury to one side of the brain may produce paralysis of that side of the head and of the opposite side of the body. May occur in connection with parturient apoplexy, lead poisoning, ergotism and the like. It may be associated with indigestion, or affect cows heavy with calf.

TREATMENT.—

Find out the cause of trouble and give treatment as directed under the same. If the cause is not well understood, the following treatment may be beneficial. Give a mild purgative, as follows:

Epsom Salts	1 pound.
Ginger	1 ounce.
Water	2 quarts.

Mix and give as one dose.

Give also the following as one dose and repeat it night and morning for a month.

Nux Vomica	2 drams.
Saltpeter	½ ounce.

Mix.

If muscular twitchings should occur, discontinue for a few days.

EPILEPSY—FITS.—

Causes.—The exact cause of epilepsy, in a majority of cases, is not known. Diseases of the brain in some cases are causes; and in other instances the trouble has been shown in connection with a diseased condition of the blood. Teething, worms, and chronic indigestion are also causes of the affection.

Symptoms.—This disease is characterized by the onset of sudden convulsions. Animal may seem in fair condition, but at any time may have an attack, manifested by staggering, falling, and violent convulsive actions of the muscles of the body. Urine or dung may be passed, during fit, involuntarily, and breathing is stertorous or snoring.

TREATMENT.—

If there are symptoms of worms or indigestion, follow the general treatment as indicated under their proper heads. If due to irritation caused by teething, the inflamed gums must be lanced. If unshed temporary teeth are the cause, they must be extracted. When the cause cannot be discovered, there is little prospect of a cure. Some benefit may be derived, however, by an occasional dose of purgative medicine, as a pound of Epsom Salts dissolved in a quart of warm water. In addition to the purgative, 4 drachms of Bromide of Potash dissolved in drinking water, three times a day, has sometimes been found efficacious.

CORNSTALK DISEASE.—Throughout the corn-growing regions of the Western and Central States it is a common practice to turn cattle into the fields after the corn has been gathered to eat the stalks and leaves that would otherwise be wasted. From these conditions occurs the disease as above named.

Causes.—The real cause is not known, but is probably either acute indigestion or poisoning by some substance in the stalks. It is most common in years when there is a heavy growth of stalks, and after the same are thoroughly dried. Attacks seem to be associated with cold, wet storms. Young cattle are more subject to the disease than old ones, and the trouble is most frequent when the cattle are first turned into the fields, or are changed from one field to another.

Symptoms.—Disease comes on with few premonitory symptoms. The first usually noticed is that animal stands "humped up" and apart from his fellows. If made to move, he does so reluctantly and with a peculiar, wabbling gait. There is twitching of the tail and kicking at the belly. Usually there are indications of delirium, and as disease advances these become more marked and associated with signs of severe pain, such as bellowing and moaning. Death usually follows in 24 hours.

TREATMENT.—

There is no medicinal treatment that has proved of any benefit, but preventive measures will greatly reduce the loss. Cattle should be well fed and watered before turning them into the fields, and some laxative food, such as alfalfa or millet, fed every day. At first, a half hour a day in the field is enough, then gradually increase until they have become accustomed to the change in food.

SUNSTROKE.—This is not a very common occurrence among cattle. Working oxen, stall-fed cattle that have been driven some distance on the road in hot weather, and cattle shut up in pens, or cars in transit, are the most subject to attack.

Symptoms.—The first are those of exhaustion—dullness, panting, frothing at the mouth, tongue hanging out, irregular gait, uneasiness, palpitation of the heart, when, if conditions are not mitigated, animal staggers, falls, struggles, and then becomes quiet, or he may continue struggling and try to get up again. In serious cases unconsciousness may come without premonitory symptoms.

TREATMENT.—

When not severe, remove to a quiet place for a few days, and keep on a reduced diet. This, in most instances, is all that will be needed. When animal has fallen, apply cold water, or ice, to the head; rub the body and limbs with cloths wet with cold water, or wisp of straw, and keep up the rubbing for some time. If power of swallowing is not lost—which can be found out by trying with a little water—give:

Liquor Ammonia fortis.....	3 drachms.
Water, cold.....	1 quart.

Be careful in drenching. Repeat in one-half hour, and again in one hour. Instead of Ammonia, the following may be given:

Spirits of Nitrous Ether.....	3 ounces.
Water, cold.....	1 pint.

Or: 4 to 6 ounces of Whiskey, or 2 to 3 ounces of Alcohol, in one-half pint of water.

The Ammonia is preferable, however. If unconsciousness continues so that the remedy cannot be given by mouth, give same amount of Ammonia and water as an injection. The common Aqua Ammonia, or Hartshorn, may be used, if other is not at hand, but it is much weaker, and 1½ ounces would be required for a dose, with amount of water as above. When Ammonia is not at hand, shake 2 ounces of Turpentine in a pint of milk and inject in the rectum, and this will be beneficial until Ammonia is procured. As soon as the animal can rise, get to a shelter. Give all the cold water it will drink, and give the Ammonia, or Alcohol, drench as long as there is much failure of strength. Sloppy food and a little freshly cut grass, in limited quantity only, should be allowed for several days. When signs of returning strength are shown, give 12 ounces of Epsom Salts in a quart of water—in those cases that have been down and unconscious; give slowly. Never resort to bleeding in this trouble.

LOCK-JAW—TETANUS.—Cattle are subject to this disease, but it is not common. Horses and mules are much more subject to it. It is serious, but not always fatal.

Causes.—It arises from operations or wounds of any kind and in any part of the body. The cause is a germ, or bacterium. that enters the system through a wound.

Symptoms.—The first symptom is usually a stiffness in the manner of carrying the head; the muzzle is elevated, "poked out"; ears are also carried stiffly, and moved little, if any. The haw or "washer" is forced over the eye, as though there were some eye trouble; animal walks stiffly, as if the legs were sticks; when turned, body is kept straight, as though a log. Animal stands with legs propped, and tail is elevated. Jaws at first are moved stiffly, and there may be grating and champing of the teeth, but if an attempt is made to open the mouth wider, rigidity will be shown. Animal will eat as long as jaws are not set; pulse at first is hard but not much changed, but later is quicker; urine and dung are passed with difficulty. As disease advances, all symptoms are more pronounced. Haw extends farther over eye, breathing is more rapid and difficult, jaws become more set and locked, and swallowing, which was difficult, becomes nearly or quite impossible. At times, and especially if annoyed, the intensity of the spasm or contraction is so great as to amount to paroxyms.

TREATMENT.—

At appearance of first symptoms, if the animal is still able to swallow, give the following drench; give carefully, as effort of giving may cause spasms and jaws will set:

Epsom Salts	10 ounces.
Common Salt	10 ounces.
Calomel	2 drachms.
Pulverized Gentian	1 ounce.
Warm water	2 quarts.

Mix, and give as one dose. Not to be repeated.

Examine closely for wounds on every part of the body. Don't neglect the slightest scratch. Put animal in a dark, quiet stall, away from noise and excitement. Wash all wounds with hot soap-suds, so that a nice clean sore is presented. Then use.

Bichloride of Mercury	30 grains.
Or, Pure Carbolic Acid	1½ ounces.
Water	1 quart.

Mix.

Pour some of this solution on each wound, and sop it with a wad of cotton or a piece of cloth, so that the wound is well saturated with the medicine. Then wet a pad of absorbent cotton with the solution, and bind on the wound. Repeat treatment once a day thoroughly on every scratch you can find, until well healed. If in the foot, cut away hoof to expose injury before dressing. Painful wounds of the feet should be poulticed twice daily for three or four days, with Linseed meal poultices, but at each change of poultice, wash wound with solution, and when this is discontinued, dress with cotton and medicine once a day. Feed regular food as long as it can be eaten, and then give sloppy feeds of bran, corn meal and small quantities of Linseed meal. Give cold water freely. Arrange so animal can get food and water with little reaching. The excitement of drenching does more harm than medicine does good, so do not attempt it. Dissolve 1 ounce of Bromide of Potash in every 2 gallons of water the patient will drink. Three times a day inject into the rectum the following:

Fluid Extract of Belladonna.....	2 drachms.
Fluid Extract of Cannabis Indica....	2 "
Warm water.....	1 pint.

Do everything in a quiet, orderly manner, and don't allow visitors to see animal. Excitement must be avoided. When improvement is seen, drop off remedies gradually, at first give two-thirds, then one-half, finally stop; but at any time return to original amount if unfavorable symptoms are shown.

LIGHTNING STROKE—ELECTRIC SHOCK.—When an animal is struck by lightning, the shock is immediately expended on the nervous system, and as a rule death occurs at once; but when not fatal, animation is suspended to a greater or less degree.

Symptoms.—When not fatal, symptoms vary according to severity of the shock. Animal generally falls as from an apoplectic attack, and symptoms are shown as in concussion of the brain. Muscular system may be completely relaxed; legs limber; muscles soft and flabby to touch, or there may be convulsions, spasms,

and twitching of the muscles. Breathing is generally labored, irregular, or interrupted, and slower than normal. In most cases the electric fluid leaves its mark by singeing the hair, or by inflicting wounds, burns, or blisters.

TREATMENT.—

So long as the heart beats, efforts to restore the animal should be made. Dash cold water over the head and body; rub the body and legs; smartly whip the body with wet towels or switches. Rub Mustard paste over the legs, back of the head, and on each side of the neck. Inject into the rectum as follows:

Liquor Ammonia fortis.....	4 drachms.
Warm water.....	1 quart.

One and one-half ounces of Ammonia may be used instead of Liquor Ammonia, if former is not to be had. Cautiously, and not too suddenly, hold an uncorked bottle of Ammonia to the nostrils to be inhaled. In desperate cases, artificial respiration should be tried. With both hands spread out, press down alternately on abdomen behind ribs, and on chest back of shoulder, in regular order, so that chest and abdomen are pressed on alternately about twenty times a minute. Press slow and steady, imitating the motions of breathing. To aid in work, a hand-bellows may be used each time after chest is pressed on, by inserting the nozzle into the nostril and gently forcing in air. When animal is revived enough to be able to swallow, give the Ammonia remedy above, as a drench, and repeat the dose in an hour. Be careful in drenching not to strangle animal.

Where shock does not produce insensibility, give the Ammonia and water remedy at once as a drench, or instead:

Brandy, 4 ounces; or Whiskey.....	8 ounces.
Water.....	1 quart.

These doses may be repeated every three or four hours if necessary. When serious symptoms are gone, give Sulphate of Quinine in 2-drachm doses twice a day until well. If any paralysis remains, give 1½ drachms of pulverized Nux Vomica with the Quinine. Burns or blisters should be treated with antiseptics as in treating wounds. Treatment applies to electric shock in every form.

CONTAGIOUS DISEASES OF CATTLE

CONTAGIOUS ABORTION.—In some regions, this is one of the most serious diseases that stockmen have to contend with, and when once established, it is difficult to eradicate.

Causes.—The cause of this disease is thought to be a germ, or a number of kinds of germs. It is transmitted from a cow that has aborted by the discharges from the vagina, or by the fœtus, or its membranes. It is also thought probable that a bull that has served a cow that has aborted, may communicate the disease to other cows.

Symptoms.—Cows may abort at any stage of pregnancy, but most commonly after the fourth month; if at an earlier period, there are few symptoms. There may be a discharge of mucus from the vagina, and the vulva may be slightly swollen; small yellow ulcers may sometimes be seen on examination, in the membrane lining the vagina. At a later period the signs are those of approaching parturition—there may be a rope of mucus hanging from vulva, milk secretion may start, and the cow be "down in her hips." The finding of the fœtus and envelopes, or the hanging of the envelopes from the vulva, is a sure indication that the accident has occurred. It is impossible to tell whether an abortion is of a contagious nature, or from other causes, and so it is safest to treat each case as if contagious. If a number of animals abort, it indicates a contagious condition.

TREATMENT.—

When a cow has aborted, or shows signs of aborting, she should at once be isolated from other cows, and the place where she stood be thoroughly disinfected by a 5 per cent. solution of Carbolic Acid, or a 1 to 1000 solution of Corrosive Sublimate—about 1 drachm dissolved in a gallon of water is a rough proportion—after the stall has been scraped and all loose litter burned. After using the antiseptic, give the stall a good coating of whitewash. Burn or bury deeply the aborted calf and membranes, and flush out the vagina and uterus with a Lysol solution, using

2 drachms of Lysol to each quart of water; 2 drachms or Carbolic Acid can be used in place of the Lysol, but the Lysol is better. The tail and hinder parts should also be washed with a 3 per cent. solution. Continue treatment of vagina and womb as long as discharge is observed, and the adjoining parts wash daily for ten days longer. A cow that has aborted should not be bred for sometime after all discharges have ceased. If the discharges continue, or any other indications of leucorrhea, treat as for that disease. Two days before breeding, wash out the vagina with the Lysol solution. Sometimes a cow becomes barren after an abortion. Cleanliness, isolation of infected cows, the free use of antiseptics, and precautions against breeding to infected bulls, are the best means of combating this disease. If these are persistently carried out the disease will finally disappear.

As preventive remedies, Sulphite, or Hyposulphite of Soda, in 1-ounce doses, twice or thrice a week, may be of value. A mixture as follows seems to give good results:

Hyposulphite of Soda..... 1 pound.
Sulphur..... 1 "
Common salt..... 10 pounds.

Mix, and give a handful to each pregnant cow two or three times a week.

In addition, keep cows in fair flesh and in a good, vigorous condition.

As the bull may be the means of spreading the disease, precautions should be taken to see that a bull does not cover a cow which has aborted, until after she has been carefully treated, and even then it would be best to disinfect the bull after covering her. He should also be disinfected after covering any suspicious cows. To disinfect the bull, pass a piece of rubber tubing into the sheath and hold the end of the sheath tight around it, elevate the other end of the tube, put a funnel in it, and pour the disinfecting solution into funnel; use the same solution as for flushing out the womb of the cow. The funnel should be held as high as the back. Hold the solution in the sheath for a few minutes after it fills. Repeat every second day for a number of days.

If a cow aborts and there is good reason to believe that it might be of a contagious nature, all the pregnant cows should

have their vulvas, and back part of hips and tails washed off once a day, for a few days, with a 3 per cent. Carbolic Acid solution, or the 1 to 1000 Corrosive Sublimate solution.

While, perhaps, contagious abortion is more often seen among cows than other animals, it may affect any of the animals; it not infrequently attacks mares where quite a large number are kept for breeding. The same general treatment should be given to all.

CONTAGIOUS PLEURO-PNEUMONIA. — This is one of the most fatal and contagious diseases to which cattle are subject. As the name indicates, it is an inflammation of the lungs and the pleura, or covering. It was brought into this country from Europe, where it has caused heavy losses to the cattle industry. Through the efforts of the Bureau of Animal Industry, the disease has been stamped out in the United States, and the only danger now lies in cattle brought in from other lands, but with our well-established and carefully carried out quarantine regulations this will probably not occur.

Causes.—On the American continent, at least, it arises from contagion by coming in contact, or being near, an animal that has, or has had, the disease within a year. The exact nature of the virus of contagion has not been determined. The time after exposure before the disease appears, is generally from three to six weeks, but may be three months.

Symptoms.—The first symptom is a rise in temperature to 103 to 106 degrees, which clinical thermometer in rectum will indicate; there will be loss of appetite; a staring coat; slight shiverings; a hard, dry cough; loss of milk; scanty urine, which is dark colored. Following this will be tenderness on pressure between the ribs over the lungs; cough will increase; breathing quicken; nose will extend; back will be arched; hind legs will be drawn under the body, and the elbows turned out. Later there will be a watery and more pronounced discharge from the nose and eyes; obstinate constipation, or a watery, fetid diarrhea; a rapid weakening of the system, ending in death. In early stages percussion over the lungs brings back a clear, resonant sound;

later it will be dull and heavy. Also in first stages, on listening, there will be a dry, crackling sound; later it will be dull and heavy.

In America the disease is apt to be more severe during warm weather. Yet the slow, sub-acute cases are just as capable of spreading the disease, hence watchfulness must be exercised.

TREATMENT.—

Perhaps one-half the affected animals will recover, but treatment does not seem to assist, and from the fact that the disease spreads so readily, medical treatment should not be attempted. Prevention consists in keeping animals so they will not be exposed to contagion. When this plague exists in a locality, the owner of healthy animals should keep his stock from coming near those affected, and from those exposed. Persons who have been on infected premises should not be allowed to visit premises where there is healthy stock. When pleuro-pneumonia breaks out in a herd, every animal in that herd should be slaughtered and buried deep, the stables cleaned and thoroughly disinfected, and no other cattle allowed on premises for 90 days. When disease has broken out, the matter should be put into the hands of government inspectors appointed for that purpose, and they will devise means for stamping it out. As has been said, the disease does not exist in the United States at the present, it having been stamped out some twelve years ago at great expense. The foregoing is simply given that stockmen may have a little idea of its nature.

TEXAS FEVER—SPANISH OR SPLENIC FEVER—SOUTHERN CATTLE FEVER.—In Australia this disease is called "tick fever," and in other sections, owing to color of urine, it is called "redwater." Cattle coming from the region south of central Virginia and Tennessee, and east of central Indian Territory and Texas, and from lower California, come from a permanently infected territory, and have the parasites of Texas fever in their blood; but they do not suffer from it, as they possess immunity, contracted when small calves.

Causes.—It is caused by a microscopic parasite, which attacks and destroys the red blood corpuscles, and is transmitted from

southern cattle to susceptible northern ones, by means of the southern cattle tick. When southern cattle, from tick-infested districts, are brought north during warm weather, the mature female ticks drop from their bodies and lay a great number of eggs, that hatch in from two to six weeks, depending upon the weather. The young ticks are active, and show a tendency to climb, and when northern cattle pass over the ground, the young ticks get on their legs, crawl up to their bodies, and soon bury their mouth parts in the skin of the belly, or inside of thighs. In this way the disease is transmitted. In about ten days after young ticks are established on susceptible cattle, they begin to show symptoms of disease. Ordinarily thirty to forty days elapse after southern cattle pass over and infect the ground, before northern cattle show signs of the affection, though it may be longer, depending on the length of time it takes the eggs to hatch. When susceptible northern cattle are taken into infected southern lands, the symptoms of the fever usually appear in from ten to fifteen days, as the young ticks are all ready to get on them at once. The litter cleaned from cars in which southern cattle are shipped, may be a means of contagion to cattle running at large. Cases from this method of contagion have been called "town-cow disease," as cows running at large in towns, where southern cattle are fed during shipment, or cars are cleaned, contract the disease in this way.

Symptoms.—There is a loss of appetite, and suspended rumination, but, though unobserved, these symptoms are preceded by a high fever, 105 to 108 F. Animal keeps by itself. As disease advances, there is great weakness, with trembling and difficulty in getting up; the head droops; the ears lop; the flanks are "tucked up;" usually constipation, though there may be diarrhea, which latter is regarded as a favorable symptom; loss of milk in milch cows; urine, toward the last, is a dark cherry-red in color, and this may be considered a marked symptom of the disease. Young ticks will be found on belly, inside of thighs, and on the fore legs and brisket. They are minute, and a close examination is often necessary to reveal them. The disease develops before the ticks reach maturity. In after-death examination, the blood is found to be thin, and does not clot readily;

the gall-bladder is distended, with a dark, thick, granular bile. Spleen is greatly enlarged, and of a tarry consistency, hence the name, "splenic fever." The liver is also enlarged, and is yellower in color than normal; especially is this noticed when it is cut open. The kidneys are, also, more or less congested, and the urine in the bladder of a red color.

TREATMENT.—

As soon as the disease appears, all well animals should be removed from the tick-infested ground and the ticks, if any, which are on them, should be removed. The sick should also be removed to tick-free quarters and ticks removed from them; this can be done by picking off many, and by applying something to destroy those remaining. Cotton-seed Oil applied with a paint brush will destroy any that may have been overlooked, or a thorough application of any of the dipping preparations will destroy them. Place the animal in comfortable quarters and give nourishing food and plenty of fresh water. It is a good practice at the outset to give a dose of Epsom Salts—from 1 to 1½ pounds, along with 3 or 4 ounces of Ginger dissolved in 2 quarts of water. This helps to get rid of some of the waste products, which are very numerous. Also give Quinine liberally—from 1 to 2-drachm doses every two to four hours as long as the fever remains high. To give the Quinine, dissolve in ½ pint of water to which 10 drops Sulphuric Acid has been added. If there is great weakness, give 2 to 3 ounces of Alcohol in ½ pint of water, three of four times a day. Good nursing counts for much; if animal will not eat, drench three or four times a day with a quart or two of milk, and the same amount of Linseed meal gruel to which 3 or 4 tablespoonfuls of Blood Flour have been added. Eggs are also good to give in the milk or gruel. While the treatment will, without doubt, fail with the severe attacks, it will help tide over milder cases, which might otherwise succumb.

Strict quarantine regulations prevent the shipment of southern cattle north, except for slaughter, and then with certain restrictions (from February 15 to December 1), so that now there is little danger of this disease, except near the quarantine line or

along the lines of railroad over which southern cattle are shipped to market. Tick-free districts south of the quarantine line are also liable to the disease if cattle having ticks on them are introduced. Cattle which have been kept free from ticks are also subject to the disease if put into tick-infested pastures. Cattle in the tick-infested territory acquire immunity by becoming infested with ticks when small calves, and having a mild form of the disease.

Immunity can be produced by vaccination; this consists in injecting a little of the blood (½ to 1 drachm) from an animal which has ticks on her, or has recently had them, into the animal to be rendered immune. The vaccinated animal has the disease in a mild form and recovers, and is then vaccinated again the second time with a larger amount of the blood, and after the second attack, if she contracts it, she can be placed in tick-infested pastures with safety. Late fall or winter is the best time to vaccinate; young animals acquire immunity more readily than old.

Cold weather kills the ticks, so the disease is not carried north during winter, and there are no restrictions with regard to shipping cattle north from December 1 to February 15. Cattle from which ticks are removed before shipping, will not spread the disease. Dipping is resorted to to remove the ticks, but is not as yet entirely satisfactory, as some of the ticks withstand the dipping.

CONTAGIOUS ECZEMA—FOOT AND MOUTH DISEASE.—This disease is also known as "epizootic aphtha," "aphthous fever" and "eczema epizootica," and is an acute, highly contagious fever of a specific nature, marked by blisters in the mouth, around the coronet of the foot, and between the toes. It attacks cattle principally, but may also be transmitted to sheep, goats, pigs, and other domestic animals. Man may contract the disease from infected animals. It is generally considered a germ disease, though the specific organism has not been discovered. The disease has prevailed many years in Europe, and great loss has followed its ravages, some sections being rarely free from it, while in other parts it appears at irregular intervals. One attack

does not confer immunity. In this country it is a new disease, the first being discovered in the early fall of 1902, in the New England states, where it was confined and stamped out by rigid quarantine restrictions, prescribed by the general government and the different states. At present the disease does not exist in the United States, and our quarantine regulations will probably prevent its ever getting a foothold. The disease varies in virulence. In some outbreaks it is much more severe than in others. As a rule the mortality is very low, the greatest loss arising from falling off in flesh and milk, and the general deterioration resulting from disease, and the restrictions in live-stock trade.

Causes.—As above stated, is believed to be due to a specific germ. Is transmitted by direct contact, and through the medium of infected food, litter, watering places, stables, cars, and attendants. Possibly contagion may be carried a short distance in the air. The milk of an affected animal is highly contagious. The time for development of disease varies, but is short—from two to twenty days; usually in three or four days.

Symptoms.—Usually begins with a chill, which may pass unnoticed. The animal keeps by itself; back is arched; hair staring; flanks tucked up; and there is shivering or twitching of the muscles. Animal moves with reluctance, and with marked lameness; a thick, yellowish secretion comes in inner corner of eye and about edges of nostril; temperature of animal rises from two to five degrees F.; pulse is accelerated. Blisters form in mouth, about the feet, and on udder, varying in size from a pea to a 25-cent piece, and are filled with a watery fluid. They soon burst, leaving raw surfaces, and shreds of tissue hanging about edges. In the mouth the blisters form on the lips, tongue, cheeks, and pad of upper jaw. The animal champs with a smacking noise, and there is a profuse slavering from the mouth. Saliva at first is normal, but later becomes thick and ropy. Mouth is often so sore that animal cannot eat solid food. The blisters about the feet are on the coronet, and between the toes, and often cause severe lameness. One or all the feet may be affected. When blisters burst, raw, angry sores result. In

severe, untreated cases, the hoof may be shed, or ulceration may involve the greater part of the soft structures of the foot. Pneumonia may also result as a complication, from inflammation extending from the mouth.

TREATMENT.—

The disease tends towards recovery without treatment, but treatment assists. Uncomplicated cases practically all recover. Flush out the mouth with astringent and antiseptic lotions. Use a lotion of Alum or Boracic Acid—an ounce to a pint of water; and also a lotion of Carbolic Acid, 2 drachms, to a pint of water. Alternate the lotions, using each twice a day, syringing into the mouth freely, letting the animal spit it out. Treat the feet as for "Foul," using the antiseptic lotion—Carbolic Acid 1 ounce, to a quart of water, and also White Lotion (see PRESCRIPTIONS, in back of book). Use lotions freely. In cases where fever is high, give fever mixture, as the following:

Fluid Extract of Belladonna..... 1 ounce.
Fluid Extract of Aconite.....1½ drachms.
Saltpeter..... 3 ounces.
Water to make..... 1 pint.
Shake. *Dose:* 2 ounces, three or four times a day.

It is also good to give ½-pound doses of Epsom Salts every other day.

In order to stamp out the disease with the recent outbreak, all diseased and exposed animals were killed. As the disease does not now exist in this country, this discussion is given simply for general information.

ANTHRAX—CHARBON.—This is a malignant, infectious disease, attacking all animals, and even man, when infected from animals. In some parts of the west, and much more so in the south, it causes great losses in cattle, sheep, and mules. Severe losses result from it in some parts of the old world. It is most common near tanneries, the infection being brought in with the hides; or in localities where the disease has existed before, and the virus still remains; or where it has been scattered from

infected localities, either by diseased animals, or contaminated materials, that may be carried by dogs or other animals, or washed by streams.

Cause.—Anthrax is caused by the anthrax bacillus, a slender rod-shaped germ that can be easily found by a microscopical examination of the blood or tissues of a diseased animal, by making cultures, or by inoculating a small animal.

Symptoms.—The symptoms of the disease vary greatly. In some cases there are no premonitory symptoms, the animal being found dead in the morning. This is often called the "apoplectic" form, seen at the beginning of an outbreak. Other cases show high fever, weakened, accelerated pulse, with discharges of bloody mucus from the bowels and other natural openings of the body. Mucous membranes are of a bluish color, and there is great weakness and prostration, as is shown by the trembling of the muscles. Toward the last, the animal may be too weak to get up, but will lie convulsively kicking, pawing and champing the jaws. Death generally occurs in two or three days, although sub-acute cases may run longer, and a few cases may recover. Dropsical swellings frequently appear on the body; also tumors, called carbuncles, which at first are hot, tender swellings, but later become cold and painless, as the result of mortification. After-death examinations show bloody spots in the muscles and on internal organs; the spleen is greatly enlarged, the interior being very dark and thick; the blood is dark, thick and tarry in appearance, and does not clot readily; the veins are distended with dark blood, and there are bloody fluids escaping from the openings of the body. After death, the animal bloats badly and decomposition takes place rapidly.

While the foregoing are characteristic symptoms of the disease, a certain diagnosis is made by having the blood and tissues examined by a bacteriologist for the germ which causes it.

As the disease is communicated to man, great care must be exercised in post-mortems, or in handling animals dying of the disease; the skin should never be removed. Unless necessary to post-mortem, to determine the nature of the disease, the dead body should be disposed of intact, with as little flow of blood or

discharges as possible, as these contain the germs in great numbers. The body should be burned, or buried deeply, covering it with lime. This best be done where it dies, if possible; if impossible, move carefully, so as to spread the infection as little as possible, and disinfect place where animal died, thoroughly, by soaking with strong disinfectants and covering with lime. After the germs escape from the body, they take on a form which will retain its vitality for years under favorable conditions, hence disinfection cannot be too thorough. Pastures becoming once infected, retain the infection for a long time. Low, damp, black soils remain infected much longer than higher, dryer soils. Animal become infested by the germs entering through wounds or with feed or water.

In man, the disease is often called "Malignant Pustule," because it appears as a sore which is hard to cure; also known as "Wool-Sorters" disease, by being contracted by people handling wool and hides from animals dying of the disease.

TREATMENT.—

Medicinal treatment is of little use; in the milder attacks, the treatment as recommended for "Texas Fever" might help to tide the animal over, but the important thing is prevention. If it should break out, remove all animals at once to high, dry pastures, and keep all animals away from where the sick die or are disposed of. A very effectual preventive is vaccination, and all animals in districts where the disease is apt to occur should be vaccinated. This is much like vaccinating against small-pox. The animal is vaccinated with material containing the germs in a very much weakened form, and contracts a very mild form of the disease. In about two weeks it is vaccinated a second time, using a stronger vaccine, and this produces immunity. The vaccine is manufactured by different firms, and is given by injecting the required dose underneath the skin with a hypodermic syringe. When this disease breaks out, a veterinarian should supervise the care of the sick, the disposal of the dead, the disinfection, and the vaccination.

BLACK-LEG—BLACK QUARTER—QUARTER ILL.—This is a rapidly fatal infectious disease of young cattle, from six months to four years of age (rarely after three years of age), associated with external swellings, which emit a crackling sound when handled, and an offensive odor when cut into; formerly regarded as a form of anthrax, but investigations have proved that it is a specific disease, produced by a germ quite different from that of anthrax. The disease is spread over quite a large part of the west, and some parts of the east and south.

Cause.—By a germ that the cattle get through wounds at pasture, or in food or drinking water. This germ will resist destructive agents for a considerable length of time, and may produce disease when inoculated, after several years of drying. Some regard moist, undrained, and swampy pastures as favorable to this trouble, but in high, dry prairies of the west it is quite as common as on lower lands. It is also thought that the disease germ does not belong naturally within the animal body, as it will develop outside the body, but being taken into the body of young animals, it finds conditions favorable and disease is produced. It sometimes breaks out in new localities where the disease has not been known before, the germs having been introduced in some manner. Infected localities are quite well known and there is no great tendency for the infection to spread any great distance.

Symptoms.—They are of both a general and a local nature. In from one to three days after infection takes place, there will be loss of appetite and rumination, with dullness, debility, and a high fever. To these will be added lameness or stiffness of one or more limbs, due to the tumor, or swelling, that invariably attends the disease. After a few days of illness the animal usually dies; toward the last becoming very weak; labored breathing; weak pulse; lowering of the temperature, and more or less distress. The tumor, or swelling, is the marked feature of the affection; in some cases it may be the first noted symptom. It may be located on the thighs—hence the name—or on the neck, shoulder, breast, flanks, or rump, but not below hock or knee; sometimes in the vicinity of throat. At first, tumor is

small, but it spreads and deepens rapidly, and when stroked or handled, a peculiar crackling sound is heard under the skin. This is due to a collection of gas formed by the germs, as they multiply. At this stage the skin becomes dry, parchment-like, cool and insensitive to touch in the center of the tumor, due to the decomposition that has taken place. If cut into, a dark red, frothy, and ill-smelling fluid is discharged. Animal shows little or no pain during operation. An after-death examination shows that the tissues under the skin are filled with blood, a yellow, jelly-like material, and gas bubbles; these, with the unchanged spleen, the clotting of the blood, and the crackling sound noted, will readily distinguish the disease from anthrax, in which the spleen is much enlarged, blood is tarry, does not easily clot, and the tumor, if present, does not crackle, and no gas is present.

TREATMENT.—

Remove well calves and young animals to uninfected pastures or quarters, and give them uncontaminated water. Medical treatment has thus far been of little avail. Exercise and purging with Salts are recommended, the latter given as a drench in ½ to 1-pound doses, depending on the size of the animal. As a prevention, all susceptible animals should be vaccinated with black-leg virus, which is a safe and reliable preventive. In regions where this trouble prevails, the young cattle should be vaccinated a month or so before it is time for the trouble to occur, and as it occurs at slightly different times in different localities, the time for vaccinating will vary some—some time during the spring or early summer.

Black-leg vaccine is made from the diseased flesh of a calf that has died of the disease, by heating it to a temperature that weakens the germs. Two forms of the vaccine are prepared—the "single," which requires but one injection, and the "double," which requires two injections, ten days apart. The double vaccine makes more trouble, and in some cases the expense of vaccinating the second time precludes its use, but it is safer to use, and unless the disease has broken out in the herd, it is recommended as giving better protection; and besides, in the case of very fat calves, which seem to be more susceptible to the disease, the single is not

entirely effectual. The vaccine is put up in various forms; some firms send it out in the form of a little pill, others in the form of a string saturated with the virus, these to be inserted under the skin—the pills with special instrument, the string with a needle—and it also comes in powder, to be mixed with water and injected under the skin with a hypodermic syringe, following directions carefully. Vaccine and instruments can be purchased through any reliable druggist. The experiment stations in many of the states where the disease is prevalent, prepare the vaccine and send it to those applying for it, with full directions for its use. While one vaccination may carry an animal through its susceptible period, it is safer to vaccinate at least once each year until the animal is two years old. Calves need not be vaccinated until they approach six months of age. Some recommend vaccinating fat calves oftener than once a year.

Inasmuch as vaccination is such an effectual preventive, it is not wise to rely upon other preventives, although the following is said to have some preventive value :

Sulphur	10 pounds.
Saltpeter	3 pounds.
Sulphate of Iron	6 pounds.
Air-slaked Lime	3 pounds.

Mix thoroughly, and use 1 pound of the mixture in 1 gallon of salt; this to be given to the animal in place of common salt.

HÆMORRHAGIC SEPTICÆMIA.— While, perhaps, this disease is not entirely confined to cattle, it is much more common with them than with the other animals. At the present time there is not much known about the disease, except that it generally runs to a fatal termination. Just how widely distributed it is, is hard to say, as in many cases it may have been diagnosed as some other disorder, as anthrax, black leg, corn stalk disease, etc.

Causes.—The disease is caused by germs, and hence is contagious; but, just how it is spread, or how the organisms gain entrance into the body is not known, but it has been demonstrated that the disease is caused by at least one specific organism, and perhaps others may cause closely related conditions.

Symptoms.—The symptoms presented with the disease are not very characteristic, and may vary somewhat; it generally runs a rapid course, and terminates fatally within thirty-six hours; it may, however, take on a somewhat chronic form. In the acute form, towards the last, at least, the animal shows great weakness or paralysis; the temperature remaining about normal. The conditions found in an after-death examination are quite characteristic, the most noticeable being the hemorrhages, or blood-stained areas which have distinct borders, and may be small red spots, or large blood-stained surfaces. These are seen just under the skin, the muscles looking as though they had been slightly bruised; they may be found on the pleura covering the ribs, lungs or diaphragm; or on the intestines, or the peritoneum lining the abdominal cavity, or on the mesentery which supports the intestines. The spleen is not enlarged, which distinguishes it from anthrax, and there is not the external swelling, filled with offensive gas, which distinguishes it from black-leg.

TREATMENT.—

As yet nothing has been found to be of value along this line, and the only practical suggestions that can be given is to separate the healthy from the sick, and use disinfectants freely, disposing of the dead the same as with those dying of anthrax or black-leg.

The foregoing is a short summary of a bulletin by Dr. Reynolds, published by the Minnesota Experiment Station, which gave the result of Dr. Reynolds' study of a number of outbreaks of the disease in Minnesota during the past three years.

TUBERCULOSIS.—Tuberculosis is a contagious disease that may attack any animal, though it is found mostly in cattle. It is distinguished by the formation, in the various organs of the body, of nodules or tubercles having a characteristic appearance, which contain the germ called *Bacillus Tuberculosis*, or Tubercle Bacillus.

Cause.—The cause is a germ, or bacterium, as above noted. The germs are always present in an animal having the disease. Any condition which weakens the animal's system lessens the

power of resistance to the disease. As a result of the drain due to the production of large quantities of milk, tuberculosis is perhaps more common among dairy cows, but any animal is apt to contract the disease if exposed to the contagion.

The disease is important, not only on account of the loss of the cattle, but because of its relation to the health of the general public who use milk. The milk from cows that are badly affected with tuberculosis, and especially if the udder is affected, is considered a dangerous food, as it may be the means of conveying the disease to people using it, unless it is pasteurized by heating to a temperature of 185 degrees F. At present there is a difference of opinion among bacteriologists as to whether tuberculosis in cattle and consumption in man are exactly the same—that is, caused by exactly the same germ or not. But until it is positively proven that they are not, it is safest to consider them as the same, and as communicable to each other.

Symptoms.—Owing to the fact that the disease may attack almost any part of the body, there are a great variety of symptoms; the severity of the attack is also a great modifying factor. The lungs are attacked the most frequently; the liver, spleen, diaphragm or midriff, lymphatic glands, bones or joints, may also be the seat of the disease. In case the lungs are attacked, and become badly diseased, the animal is out of condition and falls away in flesh; appetite is capricious; coat is rough and staring; eyes are sunken and dull. There is usually a cough, that is especially noticeable when animal is first disturbed in the morning, or when turned out to exercise. There is often a discharge from nose and eyes, that from the latter drying at the inner corners. These symptoms are by no means diagnostic, as other diseases cause them. In fact, there are no diagnostic symptoms; sometimes an animal will be badly affected with the disease and give no indication of it in its general appearance. The only means of diagnosing the disease with any degree of certainty, is to test with tuberculin. The disease is contracted by the germs of this disease entering the system of a healthy animal through wounds; by being taken in with the food or water, or by being inhaled and taken in through the lungs; mainly by the last two methods. Sucking calves may get the germs in the milk from a tuberculous

cow, in addition to the above methods. The discharges from the nose which contain the germs, being dried, are inhaled by healthy animals in the form of dust, thus producing the disease. In rare cases the disease is congenital, the calf contracting it before birth.

In after-death examination, the diseased tissue appears as lumps, or nodules, in or on the organs affected. If these lumps, which are rather hard, are cut open, they will be found to contain a yellow, granular substance, which, when cut into, seems to be gritty. In some cases it has turned to pus, with lumps of cheesy material in it. In some cases the disease appears as a fibrous growth, in reddish bunches, on the outside of the organ or part affected, giving the characteristic appearance when cut into. These tubercles vary in size from that of a pinhead, to the size of a man's double fist, or even larger. They may be scattered quite freely throughout the body, or there may be only a few. The tubercular deposit is often found in some of the lymphatic glands, the ones just back and above the pharynx, or in those between the lungs, or along the border of the intestines, or in the udder. These glands, when healthy, vary in size from a bean to that of a man's thumb, and when cut open, are solid and of a brownish color—when affected with disease they are enlarged, sometimes very much so, and show the characteristic, granular, yellow material when cut open. The tubercles are often found attached to the pleura lining the ribs, or masses of the material may be found in the liver, spleen, lungs, or any other organ of the body. In some cases the womb is literally lined with small tubercles.

TREATMENT.—

There is no known treatment that cures the disease, but there are preventive measures that are of value. The best method of preventing the disease, is to keep healthy cattle from coming in contact with affected ones, or with stalls, food, feed boxes, and drinking places that are infected. If, for any reason, an animal is suspected of having the disease, or the symptoms are plainly manifest, it should be isolated from the others and the quarters thoroughly cleaned and disinfected with strong disinfectants, and whitewashed.

Aside from protecting cattle from disease germs, the best means of prevention is the keeping of animals healthy and vigorous. While the disease will never develop without the presence of the infection, weakened animals will contract the infection quicker. Quarters that are dark, damp, filthy, and badly ventilated, are hotbeds for the propagation of the disease when it is once introduced, and in such stables the disease spreads much more rapidly than in a stable that is dry, well lighted and well ventilated. Sunlight is known to be a great disinfectant, and germs of this disease are killed when exposed to the direct rays of the sun for a few hours. An abundance of fresh air is also very important in the preservation of the health of animals, as it brings oxygen, carries away waste, and keeps stables dry. With cattle in good health, and well cared for in good stables, the disease will spread rather slowly, if by chance it is introduced.

The Tuberculin Test.—The most accurate means of detecting tuberculosis is by testing cattle with tuberculin, called the tuberculin test. Tuberculin is a liquid which represents the poison which is produced by the tubercle bacilli, but as prepared it contains no germs, so is incapable of producing the disease. The test depends upon the fact that if the animal has the disease, in from six to twelve hours after injecting the tuberculin, a rise in temperature, or fever, follows, which lasts a few hours and then subsides. The test is applied as follows: The temperature of the animal to be tested is taken every two hours throughout the day to determine its normal temperature; at about 10 o'clock in the evening the required amount of tuberculin is injected under the skin, generally in the region of the neck; six or seven hours after the injection is made, the taking of the temperature should again be commenced, and taken every hour or two throughout the day. If the animal has the disease, some time between six and twenty hours after the injection, the temperature will commence to rise, will gradually increase for a few hours, and then gradually go back to normal, generally getting back to normal toward evening. The rise of temperature may be from 2 to 6 degrees. If the temperature rises 2 or more degrees higher after the injection than it was before, it is considered a sign of tuberculosis; a rise of 1½ degrees is looked upon as being

suspicious. If the animal is free from the disease, the temperature should not rise higher after the injection than the highest before the injection. Besides the rise of temperature, the affected animal often has a chill just as the temperature commences to rise.

Points to be Observed in Making the Test.—Keep the animal under her accustomed conditions during the test; on this account, a time of year when the animal is accustomed to being in the stable, is better than a time when she is at pasture and has to be taken up. Do not give a large amount of water or feed at any one time during the test; give a little, more frequently; especially is this true of cold water, after the injection. If a reaction takes place, be sure nothing else has entered in to cause it. Do not test an animal while in heat, or for a month before or after parturition. The test does no harm at these times, but is not reliable.

The test is not infallible, but it is by far the best means of diagnosing the disease that we have. Badly diseased animals will sometimes not respond, but in such cases their condition is such as to warrant their destruction. Occasionally an animal will respond that is not diseased, but this is rare if due care has been exercised.

One test destroys the effect of subsequent tests for a year, hence, in suspicious cases, a re-testing cannot be given inside of nine months. The test in no way injures a healthy animal; it may cause one that has the disease to break down more rapidly, but this is not always true.

The test should always be applied by a veterinarian, or by some one having experience with the use of the thermometer and hypodermic syringe. The dose of tuberculin depends upon its strength—different firms prepare different strengths.

All animals having the disease best be destroyed, as no curative treatment is known. The test in no way indicates the degree of the infection, and so the animal that responds may be very dangerous from a standpoint of spreading the disease, or it may not be so dangerous. While healthy calves can be got from affected animals by removing them from the cows as soon as

dropped, in but few cases will it pay, as the expense of keeping the diseased by themselves is too great, and then there is always some danger that the infection will in some way be carried to the healthy animals.

If a herd is tested and some respond, the stable should be thoroughly cleaned, disinfected by solutions and by fumigating (see "Disinfection," page 66), and then whitewashed. Afterwards the herd should be tested once a year for three or four years. No new animals should be introduced into the herd until after they are tested.

While this disease is not very prevalent, taking the country at large, yet many herds are affected, and it is always safest, especially when high prices are paid for pure-bred cattle, to buy them subject to the test.

LUMP-JAW—BIG-JAW; ACTINOMYCOSIS.—This disease is due to a vegetable organism that gains entrance to the tissues, and growing, produces a lump, or tumor, which may grow to a large size. The disease generally affects the upper or lower jaws, but may affect the tongue (when it is called "wooden tongue"), or other parts of the body. The tumors are not infrequently found about the throat, just back of the lower jaw. The disease is also found in the lungs.

Causes.—The disease is caused by the organism known as the actinomyces, or ray fungus. The fungus grows on plants and it is supposed that it gains entrance into the body by being taken in with the food, entering through some wound, a scratch, perhaps, inflicted by harsh food, or about the teeth at shedding time. The disease is rarely, if ever, transmitted directly from one animal to the other. While the pus from the tumors contains the fungus, yet for some reason it does not have the power to produce the disease even when injected directly into another animal. The only way to transmit the disease directly from one animal to another, is to introduce a piece of the diseased tissue itself underneath the skin of another animal; this course would never occur naturally. The disease cannot be strictly called contagious, and the only way that the diseased animal can be a

LUMP-JAW; ACTINOMYCOSIS OF THE JAW.
See page 521.

LUMP-JAW.
Skull showing bony enlargement.

means of spreading the disease, is by the fungus in the discharging pus, when discharged upon grass, growing and regaining its vitality, and becoming a source of infection to others, through the food. On this account it would be best not to allow animals with running sores to run at pasture, where other animals are to be pastured.

Symptoms.—The first symptom is a slight swelling, such as might come from an injury, usually appearing upon the upper or lower jaw, but as before stated, may form in other places. Where the bone is affected, the enlargement is due to the outward bulging of it, and when the soft tissues are affected, it is due to an increased growth of the tissue, as a result of the inflammation and irritation that the growing fungus produces. As the disease advances the tumor grows, and finally breaks, discharging a thick, sticky pus, but causing little diminution in the size of the growth; the wound may heal over, but it gradually becomes larger and breaks again. The only peculiarity about the pus is that it contains small, hard, yellow grain-like particles, not much larger than the point of a pin; these can best be seen by spreading a thin layer of pus on a piece of glass. If the jaw is affected, the teeth, in affected part, may become sore and interfere more or less with eating. Sometimes the disease develops very slowly, sometimes rapidly. The case represented in the cut was six months developing. When the bone is affected it becomes very porous. The only positive diagnosis of the disease is to have the pus examined with a microscope for the fungus.

TREATMENT.—

If the tumor is free from the bone and away from large blood vessels, the best treatment is to dissect it out, cutting well back so as to be sure and get it all, and after removing the tumor, apply a caustic around the inside of the sack to slough out any that may be left—Caustic Potash can be used, rubbing it around in the interior. Leave the wound open, so if growth starts it can be sloughed out. After the slough comes out, apply to the sore, once a day, the Iodine Ointment. (See PRESCRIPTIONS, in back part of book.) If the tumor has pus in it, open it and let the pus out, and then slough out the interior as above. There

are sloughing preparations in the market which, if used early, will kill the fungus and reduce the size of the tumor. Fleming Brothers, Union Stock Yards, Chicago, put out one of these preparations.

Along with the external treatment, it is well to use Iodide of Potash internally. The drug is given until a condition known as "iodism" is produced; this is recognized by the animal going off its feed, eyes and nose discharging, hair becomes harsh and rough, skin harsh and wrinkled, especially on top of the neck, and a large amount of dandruff in the hair — large bran-like flakes. When these symptoms are plainly produced, the medicine is discontinued for a time. If symptoms are very marked, give a dose of Epsom Salts, and also a tablespoonful of Saltpeter twice a day for a few days. After two or three weeks repeat the treatment. To give the drug, dissolve 2 ounces of Iodide of Potash in a pint of water, and give 1 ounce of this solution in ½ pint of water twice a day for a few days, and then three times a day until the iodism symptoms are produced.

As to using the meat of an animal affected with this disease: If the disease is localized about the head and does not produce any constitutional disturbance, there would be nothing unwholesome about the meat, discarding quite a large portion in the vicinity of the tumor. There would be nothing unwholesome about the milk until the animal became constitutionally affected.

In case of operations, if possible have a veterinarian perform them.

HYDROPHOBIA—RABIES.—It seems unnecessary to repeat the general statements regarding this disease in the HORSE DEPARTMENT of this work (page 227). The disease is, of course, incurable, and from its dangerous nature, a suspected animal should be immediately confined, and as soon as the symptoms become pronounced, it should be killed, and the carcass buried.

COW POX—VARIOLA VACCINNÆ.—This is a contagious disease similar to, if not identical with, as is claimed by some, small pox of the human family. A heifer inoculated with small pox virus, will have a disease identical with cow pox, and

when men are vaccinated with cow pox, the resulting disease is similar to a very mild form of small pox, and renders immunity to small pox. The question of identity does not seem well settled. The fluid from the pustules of cow pox is the material used to vaccinate people against small pox. Disease may be transmitted to man by sores on the hand when milking an affected cow.

Symptoms.—Cow pox, or kine pox, is a specific disease, probably produced by some kind of an organism, and develops in from three to nine days after inoculation, showing itself by a slight fever for a couple of days, which may be overlooked, then breaks out in pimples on the teats and udder, and may extend to the flanks, escutcheon, and around the vulva, nose, mouth and eyes. These pimples, red at first, enlarge from day to day, until they reach a diameter of one-half to one inch, and become yellow. A distinct blister forms, breaks, runs a yellowish lymph, which contains the active virus of the disease, dries up, a scab forms over it, which leaves a pit when it comes off. The only trouble to be had from the disease in cattle is in milch cows, from the teats getting sore. These are covered with small blisters, that may become confluent—run together—rendering milking a very painful operation.

TREATMENT.—

Disease runs its course in from ten to twenty days, and little treatment is necessary, except to keep the parts soft by some healing ointment. Oxide of Zinc Ointment is good. After milking, apply a little White Lotion (see PRESCRIPTIONS, in back of book), also Carbolic Acid lotion, and follow that with Zinc ointment, or some of the preparations recommended under "Chapped or Sore Teats." The following solution is also recommended as a wash:

Hyposulphite of Soda.....	2 ounces.
Water.....	1 pint.

Mix and wash frequently.

When the udder is greatly inflamed, bathe with hot water, as for "Inflammation of the Udder," and give the same drugs internally as for that disease. In milking, animals affected with

cow pox should always be milked last, in order that the disease may not be conveyed to the healthy cows. After milking, the hands of the milker should be carefully washed and disinfected. A milking tube may be used when the teats are sore and give very much pain. Milk from cows with cow pox should not be used for food.

Sometimes when the disease breaks out in a herd, all the cows are vaccinated on some part of the body away from the udder, as the hips or neck, in which case the sores are not apt to form on the teats and udder, and do not interfere with the milking process.

GENERAL DISEASES OF THE BLOOD

PLETHORA.—This may be defined as a very rich condition of the blood; it is conducive to very many serious results by interfering with the circulation, especially that through the vital organs, rendering them inert and unable to eliminate from the system the waste material which at such a time exists in increased amount. When left in the system, these impurities lead to blood poison, to congestion and inflammations in case of disease, thus greatly increasing dangers attending disorders of all kinds.

Causes.—Are rich, stimulating food, such as oil-cake, corn, and other grains, rich pastures, in fact anything that fattens very fast, especially if the animal does not get exercise enough. Of course the condition is normal up to a certain point whenever animals are fattened; when pushed too far, however, the system becomes an easy prey to disease—rheumatism, inflammation of the feet, and other disorders are apt to occur.

Symptoms.—Unusually rapid improvement, exuberant spirits, sleek hair, loose skin, and tendency to fatten rapidly. Occasionally slight fever may be seen, at first of short duration, but increasing with each attack, until violent congestion occurs, followed by inflammation of some part of the body.

TREATMENT.—

Deplete the animal by giving a good purgative, 1½ to 2 pounds of Epsom Salts dissolved in 2 or 3 quarts of water. Also give a tablespoonful of Saltpeter three times a day, and cut down on the feed. Aside from this give treatment for the special disease which develops.

ANÆMIA.—This is a condition of the body when there is a deficiency of blood, or blood corpuscles, the reverse of plethora, seen in animals from a lack of sufficient or proper kinds of food, especially when this lack is accompanied by exposure to the weather, or impoverishment of lice or other parasites; also the result of wasting diseases. It is apt to lead to purpura hemorrhagica, rheumatism, etc., and always predisposes to lice or other parasites.

Symptoms.—The animal is weak, unthrifty and dull, and the mucous membranes of the eye and nose are very pale.

TREATMENT.—

If infested with lice or other vermin, destroy by treating as directed under proper heading, and give the following Iron tonic:

Liquid Chloride of Iron..... 3 ounces.
Quinine..... 1 ounce.
Water to make..... 1 pint.

Shake. *Dose:* 1 ounce in ½ pint of water, mixed in the grain, three times a day.

Use for two weeks, then discontinue and use tonics, as recommended for "Chronic Indigestion." Give a liberal amount of good feed.

RHEUMATISM.—

Causes.—The immediate cause of rheumatism is a peculiar kind of acid that has accumulated in the system, and which has a tendency to produce inflammation around the joints, along the sheaths of the tendons, and in the synovial membranes. The exciting causes are over-feeding, rendering the system too prethoric, or exposure to cold and dampness from want of shelter and poor stabling.

Forms.—In the acute form, which is the most common, the affected parts swell, and often suppurate, discharging quantities of pus and with it more or less synovial fluid. It often extends to the bones and the membranes covering them, when it takes on what is called a chronic form, and more or less bony growth is thrown out, which may stiffen the joint. The disease also often extends to the chest, and settles in pleura, heart, etc., and sometimes causes fatal diseases of the latter organ. The disease may affect the muscles, causing them to be sore and stiff, and sometimes to contract and distort a part.

Symptoms.—There is lameness, stiffness and disinclination to move, and a staring coat. After this a joint—or perhaps more than one—begins to swell, and is found to be hot, hard and painful. A day later some other joint may be found swollen, or perhaps another leg is affected, the disease showing a tendency to go from one place to another. There is considerable fever, with high pulse, reddened mucous membranes, and an inclination to remain lying down. Bowels are apt to be constipated, and the urine scanty and high colored. Abscesses may form and discharge pus.

TREATMENT.—

Keep animal in a dry, warm stable, with ample bedding. Apply dry heat to the affected parts in the form of hot water bottles, or hot salt bags, covering with woolen blanket. Also bathe affected parts with some soothing lotion, as:

Soap Liniment	3 ounces.
Witch Hazel	2 ounces.
Turpentine	1 ounce.
Laudanum	2 ounces.

Shake. Apply twice a day with liberal rubbing.

Internally give the following:

Fluid Extract of Belladonna	1 ounce.
Fluid Extract of Aconite	1½ drachms.
Fluid Extract of Colchicum Seed	1 ounce.
Saltpeter	3 ounces.
Water to make	1 pint.

Shake. *Dose:* 2 ounces, three times a day.

Also give 1 to 2 drachms of Salol three times a day, in a little thin gruel. Keep the bowels loose with occasional doses of Epsom Salts, and give a laxative diet.

URÆMIA.—This disease is the result of the kidneys and bladder not performing their functions in a right manner, and the urine is absorbed back into the system, causing a poisoning of the blood from an accumulation of urea.

Symptoms.—There is loss of appetite, dullness, and a failure to secrete the urine; the nose and mouth are dry, and the former is fetid; rumination ceases, the coat stares, and a smell of urine is detected on the skin; the pulse and respiration become slow, and the former is soft; pupils of the eyes are dilated, and delirium, stupor, and death follow.

TREATMENT.—

Examine the urinary organs very carefully to discover, if possible, the cause, and then give treatment to remove same. Give large quantities of Linseed tea to drink, and as a mild purgative the following:

Epsom Salts	1 pound.
Ginger	1 ounce.
Water to make	2 quarts.

Mix, and give as one dose.

Also give 2 ounces of Liquor Ammonia Acetatis, three times a day.

Feed on a laxative diet. Study over the diseases of the urinary organs and try and find out which is operating to cause the trouble, and treat accordingly.

PYÆMIA AND SEPTICÆMIA—(BLOOD POISONING.)—This is a condition that results from absorbing into the system, putrid, poisonous matter, or pus, especially that from an ulcer, or suppurating surface.

Symptoms.—There is high fever, with increased temperature; the pulse is hard and fast, and the breathing is quickened; the breath is fetid; rumination is suspended and appetite lost; coat is

staring; rapid loss of flesh, and in fatal cases delirium. There is also the abscess, or wound, from which the poison is absorbed, which, if situated externally, can be seen; if the abscess is internal it will be overlooked.

TREATMENT.—

Find the cause, if possible, and if a sore of any kind containing confined pus, let it out and dress the wound with a 3 per cent. solution of Carbolic Acid, applying it two or three times a day, using a syringe; if on the surface, bind on a sponge wet with the solution; give internally the following:

Liquid Chloride of Iron	3 ounces.
Quinine	1 ounce.
Saltpeter	4 ounces.
Water to make	1 quart.

Shake. *Dose:* 2 ounces, in 1 pint of water, three or four times a day.

Also give, alternating the doses with the foregoing, the following:

Fluid Extract Digitalis	6 drachms.
Fluid Extract of Nux Vomica	2 ounces.
Fluid Extract Colchicum Seed	1½ ounces.
Alcohol	8 ounces.
Water to make	1 pint.

Dose: 1 ounce, three or four times a day.

Give a mild purgative in the form of 1 pound of Epsom Salts and feed on a laxative but nourishing diet.

PURPURA HEMORRHAGICA.— This is a specific blood disease, that is somewhat common in horses, but rare in cattle.

Causes.—It is caused by an impoverished condition, more especially, of the blood, which becomes deficient in some of its elements, and oozes through the coats of the blood vessels, and produces swellings in the more dependent parts of the body, causing swelling of the legs, and belly, and also of the head. (See description of the disease in the HORSE DEPARTMENT).

TREATMENT.—

Give the same treatment as recommended for the horse, giving from one and one-half to twice the dose given to the horse.

HAEMATURIA—RED WATER.—As the name implies, this is a disease in which the urine becomes red in color, due either to the presence of blood itself, or to the red coloring matter of the blood, which is set free and thrown off by the kidneys, as a result of the breaking down of the red blood corpuscles from various causes.

Causes.—If blood itself is present, this is due to inflammation or some disease of the urinary organs themselves—injuries to the loins, strains, calculi in bladder or kidneys, etc. If the urine is simply colored by the coloring matter, it may be due to some specific disease, as Texas fever; or it may be due to an impoverished condition of the system, as the result of poor feed, especially the pasturing of cattle continuously on certain kinds of low, swampy lands. The condition may also be due to eating poisonous plants, which irritate the kidneys, or using medicines too freely, which act upon these organs.

Symptoms.—There is the colored condition of the urine, which varies from a light red to a dark brown, and in some cases it is much increased in quantity. If blood itself is present, there will be the symptoms of the disease of the urinary organs, causing the trouble (see DISEASES OF THE URINARY ORGANS). If the trouble is due to some specific disease, as Texas fever, the symptoms of that disease will be present. If due to an impoverished condition, there will be unthriftiness; animal will become weak; pulse will be weak; anæmia will be present; the animal will become poor in flesh, and unless the condition is corrected, death will occur.

TREATMENT.—

If due to the blood, treat the disease causing it. If from a specific disease, treat that. If from an impoverished condition of the system, give first-class nourishing food; if from running on low pastures, change to higher and better. Also give tonics, especially the Iron tonics as recommended for "Chronic Indigestion." If animal is very low, give the following for a week or two, and then change to the tonics as recommended above:

Liquid Chloride of Iron..... 3 ounces.
Quinine..... 1 ounce.
Water to make..... 1 pint.
Shake. *Dose:* 1 ounce, in a pint of water, three times a day.

Alternate with these doses the following:

Fluid Extract of Nux Vomica.....	2 ounces.
Fluid Extract of Gentian.....	3 "
Fowler's Solution of Arsenic.....	10 "
Water to make.....	1 pint.

Shake. *Dose:* 1 ounce in a little water, three times day.

If the heart is weak, give 2 ounces of Alcohol in ½ pint of water, two or three times a day.

HOLLOW HORN AND WOLF IN THE TAIL.—These imaginary diseases, which in the past were supposed to be the cause of a great many deaths among cattle and which were treated by boring a hole into the horn and pouring in all sorts of irritating substances; or slitting open the tail and filling the cut with the substances, are now known by nearly every one to be purely imaginary, but as we still occasionally hear them referred to, they are mentioned in this connection. The horns of nearly all cattle are hollow, and the fact that a horn is hot or cold indicates but little in diagnosing disease. If the tail shows anything wrong, salt and pepper will be of no value. Tone the animal up, or if an abscess forms, as of course it might from various causes, treat as any other abscess; some little irritation or disorder about the tail need not be looked upon as the cause of constitutional disturbances. Do not be guilty of such foolish and barbaric operations as those referred to above.

ABSCESSES.—Commonly these are called "gatherings." They are accumulations of "matter," or pus, in cavities within the tissues of the body. There are two kinds, classed as "acute" and "cold." Acute abscesses form rapidly, and are accompanied by marked inflammation, with heat, pain, redness, and swelling. Cold abscesses are of a chronic nature, forming gradually without marked symptoms of inflammation until they are of considerable size. Abscesses are caused by some injury, by bacteria, foreign bodies, or irritants within the tissues.

TREATMENT.—

There are two methods used in the treatment of abscesses: The absorption, or "scattering" treatment, and the "drawing

to a head" method. In some cases it is a good plan to try and "scatter" the abscess by rubbing and by applying remedies to absorb the pus, or fluid. Rubbing with a stimulating liniment, or applying light blisters, is useful. Iodine, either as tincture or ointment (see PRESCRIPTIONS, in back of book) may be applied daily until the skin gets sore, and then stop application for a few days, and then apply again. This is good in the removal of bunches and enlargements, but best be applied when there is no acute inflammation in the part. The second method, and the one generally used, is to encourage the formation of pus, as an abscess is usually an effort on the part of nature to rid the body of some injurious substance. Bathing, or fomenting, the affected part with hot water and the applying of poultices to soften and soothe the tissues, assist materially in "drawing abscess to a head." As soon as pus, or matter, is detected in the tissues—which is indicated by a soft fluctuating feeling when the part is manipulated under the fingers—the abscess should be opened. To do this use a sharp-pointed knife, taking the blade firmly between the thumb and forefinger about the distance from the point that it will be necessary to insert knife-point to reach the pus cavity. Insert quickly at the lowest part, so there will be no pocket, and the pus will all drain out. Make opening large enough to allow pus to escape freely and then wash out and treat cavity. Abscesses should always be thoroughly examined for foreign bodies, such as sticks, pieces of bone, and the like, and if found should be removed. When cavity is empty, wash out and treat with antiseptics freely. The incision should not be allowed to heal until cavity has healed from the bottom, or another abscess is likely to follow. Keep open by plugging with absorbent cotton, or tow. The hair below a wound should be well greased, and kept so, in order to prevent the discharges from irritating, or scalding, the skin.

If an abscess is not opened, it will usually break and discharge of its own accord at last; but as the pus burrows into the tissues seeking an outlet, the early opening of the cavity greatly hastens the final recovery. In opening abscesses, care must be taken not to cut, by mistake, into a hernia or rupture, or into a joint or cavity containing synovial fluid or "joint oil." If the abscess

is in the vicinity of large blood vessels or important organs, precautions must be taken to prevent injury to them. In such places it is generally best for the inexperienced to continue poulticing until the abscess breaks of its own accord, after which it should be treated as above.

POISONS AND THEIR ANTIDOTES.— For symptoms and treatment, see HORSE DEPARTMENT (page 329).

In case of antidotes, the dose for cattle is one-and-one-half to double the dose given to a horse of the same age.

OPERATIONS

With operations upon cattle, the same general principles should be carried out as given, under OPERATIONS, in HORSE DEPARTMENT. Anæsthetics are used the same way. The same antiseptics—Carbolic Acid and the like—should be used freely on instruments, hands, and place of operating. Cattle can be secured by holding with the snap-ring "bull-dog," in the nose, or by putting head in stanchion; if operating about the hind limbs, tie the legs together with a piece of rope just above the hocks, crossing the rope between the legs like a figure 8, so that it will not slip down ; or cattle may be cast the same as the horse; or secured in the stocks.

HOW TO RING A BULL.—First secure the bull by throwing him, or put him in a narrow stall. To insert the ring, first whittle a piece of wood so it may be entered into the nostril to meet the blow given on the punch. Select a hollow punch to make a hole corresponding to the ring. See that the bull is tied securely, if not thrown and secured, and let the assistant hold the piece of wood. Set the punch in the opposite nostril, low enough so it will not cut the cartilage (gristle) of the nose, and strike a smart blow, forming the hole. Put in the ring, set the screws tight and the work is done. Some burn the hole through the partition by using a red-hot, pointed iron. Have an assistant,

with a glove on his hand, take hold of the nose and stretch it forward to open the nostrils, then push the iron through and jerk it back quickly.

DEHORNING.—This consists in the application of some substance to the budding horns of calves that will prevent their growth, or in the removal of the horns by some surgical operation. It is better to remove, or prevent the growth of, horns in calves than to wait until the animals have attained their growth.

The best method of removing the horns is to apply Caustic Potash to the budding horn as soon as the button can be felt beneath the skin on the head of the calf; within a week after birth. The hair should be clipped off, the skin over the immature horn wet, and then well rubbed with the stick of Caustic Potash; the fingers being well protected from it by wrapping the stick with a paper. In applying the Caustic, use care to cover the whole button, for after the horn is started, it is difficult to remove with Caustic. Rub each button for about a quarter of a minute, let it dry, then wet the stick of Caustic a little and rub again the same length of time. Do not get too wet, or the Caustic may run down, making a large sore, or get into the eye. It is much better to use the Caustic than to gouge out the buttons, as is sometimes done.

In removing the horns from the mature animal, the beast is confined in a stanchion, or chute, made for the purpose, a halter is put on the head, and the latter pulled well forward and to one side, and firmly held. The horn is then removed, either with a saw or with a dehorning shears made for that purpose. In removing the horn, a small ring of the hair is to be taken off with the base of the horn, or the horn will grow out as a stub. After the horn is removed, some Pine Tar with a little Carbolic Acid in it, may be applied, and a layer of clean cotton batting, which has been previously heated in an oven for a half hour or so, placed over the wound to stop the bleeding and keep out the dirt. If bleeding is bad, apply to the wound with a small brush a little Monsel's solution, or sear with a hot iron, or take hold the bleeding vessels with pincers and twist them. Cattle should not be

dehorned when flies are bad, and, after dehorning, should not be allowed access to straw stacks where they can get chaff into the wounds. While dehorning causes pain at the time of the operation, it does away with the inflicting of pain on other animals, as is also apt to be the case with some individuals. It is not necessary to apply the cotton to the stubs after the horns are removed, and it best not be done unless the cotton is kept very clean and treated as above. If it is applied, and after two or three days there is any indication of pus collecting under it, remove it and wash the wound with an antiseptic solution, turning the head up sidewise to let any pus run out that may have formed in the cavity.

BLEEDING.—This once very common operation, in both the human family and the lower animals, is not now performed at all with the human, and is fast becoming an operation of the past with animals, and should be so entirely, as it has no virtue as a curative agent.

TAPPING THE CHEST.—This operation has for its object the removal of water in "Hydrothorax." Clip off the hair from a spot about three inches back of the elbow, and on a level with it. Make an incision through the skin and muscles to about the depth of two inches, being careful to locate it so it will pass between two ribs, and not too close to the posterior aspect of the front one of the two—as near midway as possible. Now pass in the trocar and canula, withdraw trocar, and leave canula to draw off the water. Should any substance clog the canula, push it away with a probe. The other side may be tapped in the same way. A horse trocar is about the right size. The antiseptics should be used freely during the operation. The operation should be left to the veterinarian, as it is not always easy to tell when it should be performed. The after-treatment is to apply the antiseptics to the wound, two or three times a day.

TAPPING THE BELLY.—This operation is to empty the abdominal cavity in case of "Ascites." Make the incision through the skin in the center line of the belly, just back of the navel, and just large enough to admit the trocar and canula; then insert the instrument into the cavity and let the fluid flow off. The same principles apply as in "Tapping the Chest."

TAPPING THE BLADDER OF OX OR BULL.—When it is necessary to draw the water of male cattle, an opening must be made at the point where the urethra turns over the angle of the pelvis, just below the anus, and the catheter introduced at this point. The incision should be made very carefully, and no larger than is really necessary to introduce the instrument. Dress the wound with a 3 per cent. solution of Carbolic Acid, twice daily. If it is desired that the opening heal up at once, it is advisable to take a stitch in it. Sometimes, when the urethra is obstructed below, it is left open, the animal urinating at this point. The curve of the urethra canal, when penis is not protruded, is what makes this operation necessary, as it renders the introduction of the catheter by the penis impossible. The operation should be left to a veterinarian.

TAPPING THE PAUNCH, OR RUMEN.—This is an operation performed to relieve animals in severe cases of "Tympanites, or Hoven," when medical treatment is of no avail.

Find the center of a triangle made by the last rib, the anterior point of the hip, and the transverse processes of the lumbar spines on the left side, or where the bloat is most prominent. Insert the trocar at this point, directing it downward and inward obliquely, and it will pass directly into the paunch. Pull the trocar out and the gas will escape through the canula. Puncturing is not a serious operation in cattle, and in cases of great distension should be performed without hesitancy or delay. Relief is almost instantaneous. The horse trocar and canula is large enough for cattle (see cuts of instruments, MISCELLANEOUS DEPARTMENT). Have the point of the trocar sharp and use the antiseptics on instrument and point of tapping. Every stockman should have a trocar and canula.

RUMENOTOMY.—The operation of opening the paunch, or rumen, in cattle and the removal of the contents of the same through the opening, is called rumenotomy. It should only be performed where the paunch is excessively overloaded and distended. Clip the hair over the point on the left side, described in "Tapping the Paunch, or Rumen," and make an incision, running up and down, large enough to admit the hand. Use the Cocaine

solution (see OPERATIONS, HORSE DEPARTMENT). Open first the skin, then the muscles, and then the wall of the paunch. Insert a clean towel, wet in the antiseptic, and arrange it to cover the lower edge and part of each side of the wound, to keep the food from falling into the abdominal cavity. Now remove from the paunch with the hand, half or more of the material.

Wash the edges of the wound with a little Carbolized warm water and sew it up with cat-gut sutures. Sew up the paunch first, putting in the stitches quite close together; then the muscles, then sew up the skin with silk. Dress the whole with 3 per cent. lotion of Carbolic Acid and water, keeping the parts wet nearly all the time. The cat-gut sutures will be absorbed. Feed animal on light, laxative diet for a week or more, and give a tablespoonful of Saltpeter two or three times a day. The operation should always be left to the veterinarian when he can possibly be had.

CASTRATION.—See "Castration" in DISEASES OF GENERATIVE ORGANS OF THE BULL (page 457).

SPAYING.—This is an operation to remove the ovaries of the cow. In young heifers it is best done in the flank. Fast the animal twenty-four hours. Secure the animal in the stocks. Clip the hair from the same place as for "Rumenotomy," and make an incision through the skin and muscles into the abdominal cavity, the same as in that operation, large enough to admit the hand. The rumen, being partially empty, will be forward, out of the way; pass the hand in, down and back and find the womb, follow it up to the end of the horn and find the ovary, one-half the size of a man's thumb; pass in a long ecraseur, slip the ovary through the loop in the chain and take it off, the same as the instrument is used in castrating colts. Be careful and do not drop the ovary. Take off both ovaries through the same opening. Stitch up the muscles with catgut, the skin with silk, the same as in "Rumenotomy;" the after-treatment is also the same.

Cows can be operated upon through the vagina. Peritonitis sometimes follows the operation, in which case the symptoms

and treatment would be the same as given under that head. This will rarely happen if antiseptics are used freely throughout the operation.

The operation should be left to the veterinarian, or should not be attempted at least, until after it has been seen performed a number of times.

CÆSAREAN OPERATION.—This is sometimes demanded, when the distortion and narrowing of the hip bones are such as to forbid the passage of the calf, or when inflammation has practically closed the natural passages and the progeny is more valuable and worthy of being saved than the dam; also in cases in which the cow has been fatally injured, or is ill beyond possibility of recovery and yet carries a living calf. It is too often a last resort after long and fruitless efforts to deliver by the natural channels, and in such cases the saving of the calf is all that can be expected, the exhausted cow, already the subject of active inflammation, and too often also of putrid poisoning, is virtually beyond hope. The hope of saving the dam is greatest if she is in good health and not fatigued, in cases, for example, in which the operation is resorted to on account of broken hip bones or abnormally narrow passages.

The stock owner will not attempt such a serious operation as this. Yet, where the mother has just died or is to be immediately sacrificed, no one should hesitate at resorting to it in order to save the calf. If the cow is to be sacrificed, a blow on the head with an ax will secure quietude. Then the prompt cutting into the abdomen and womb, and the extraction of the calf, requires no skill. The operation to save both cow and calf requires professional skill, hence will not be described here.

SUTURES AND BANDAGES.—Sutures are used in sewing wounds whenever it is desired to hold the edges together. The material generally used is silk, doubled once or twice, to make the cord large to prevent it from pulling out. Cat-gut is also used; it should be used where stitches cannot be taken out, as it will be absorbed; guitar or violin strings answer nicely for sutures. Pass the needle through the skin, about one-half inch

back from the edge of wound, and tie so the edges are just brought together, leaving the ends about one-half inch in length.

Bandages are particularly useful in wounds on the legs, since there the stitches will almost always pull out, unless thus reinforced. For other details on the subjects, see OPERATIONS in the HORSE DEPARTMENT.

GIVING MEDICINE TO CATTLE.—(See cut)—To give cattle medicine, catch them by the nose, the thumb in one nostril, the forefinger in the other, and hold the nose up only a little above the level, and keep the head and neck straight with the body, put the nozzle of the bottle in the mouth and pour the medicine in slowly. If the head cannot be held with the hand, put the spring ring "bull dog" in the nose, tie a rope to it and put the other end of the rope through a ring overhead, and the head can be held up.

GIVING THE SHEEP MEDICINE.
Do not raise the nose but a little.

SHEEP

DISEASES AND THEIR TREATMENT

CATARRH, OR COLD IN THE HEAD.—This is an inflammation of the mucous membrane which lines the nasal passages, and which sometimes extends down into the throat.

Causes.—Exposure in cold rains and sleet, especially during the fall and spring seasons. It also occurs during the washing and shearing time.

Symptoms.—There is a discharge from the nose, and affected animal keeps snuffling, sneezing and coughing; does not eat or feel well.

TREATMENT.—

The best course is to prevent such trouble by not having cause. Good, comfortable, well-ventilated quarters, that in bad weather are always accessible, will usually effect a cure without any further treatment. In case it will not yield to this treatment, give the following mixture:

Saltpeter	4 ounces
Sulphur	4 "
Gentian Root, powdered	4 "

Mix and give twice a day, 1 teaspoonful in its feed; or if it will not eat, shaken with water from a bottle.

Or, give ½ teaspoonful doses of Sulphate of Iron 3 times a day in its feed, or dissolved in water, from a bottle. Give soft food, keep dry, and wash off any discharges that accumulate about the head. In very bad cases with valuable animals, steam the head as recommended for the horse.

DISTEMPER, OR EPIZOÖTIC CATARRH.—Malignant, epizootic catarrh is a disease that is accountable for the loss of many thousands of sheep. In the malignant form it is a congestion and inflammation of the nasal cavities, extending sometimes into the stomach and bowels.

Symptoms.—At first there may be only a nasal discharge; animal appears dull and drooping; the eyes run a little and are partially closed; the pulse is slightly increased in frequency and is languid; more or less loss of appetite; breathing is not affected unless the bronchial tract is involved. After a few days, unless relieved, the symptoms become aggravated; the nasal discharge is thick and glutinous and sometimes tinged with blood; the eyes are nearly closed, with a thick, yellow secretion about them. There is great prostration and emaciation; the pulse is very weak; respiration is difficult; no appetite and animal soon dies.

TREATMENT.—

Put the sheep in warm, well-ventilated place, and if bowels are costive give the following:

Carbonate Ammonia	1 ounce.
Rhubarb	1 "
Ginger	2 ounces.
Gentian	2 "

Simmer Rhubarb, Ginger and Gentian for 15 minutes in 1 quart of water, and when cold add the Ammonia and cork bottle.

Dose: 2 tablespoonsful three times a day.

Also give ½ teaspoonful doses of Saltpeter and 15 to 20 drop doses of Fluid Extract Belladonna three times a day. Give good nourishing food and drink, for without care medication is not of much value. Steam the head as described in HORSE DEPARTMENT.

HYDATIDS ON THE BRAIN.—The bladder worm, which is the cause of this disease, is one of the larval stages of the tapeworm. The disease is spread by dogs, which eat the head of sheep that have died of this disease, and through their excrement spread it in fields and pastures where sheep run, where it is taken into the mouth in grazing. Dogs should not be allowed to eat uncooked heads, nor prowl in strange pastures.

Symptoms.—Animal has a dull, moping way; will separate from the flock; is unsteady in gait, and will sometimes stop suddenly and fall, and at other times run across the field, paying no

heed to fence or ditch; after the disease has existed for some time, will almost constantly move in a circle.

TREATMENT.—

When the hazard and cruelty attending an operation are considered, as well as the liability of a return of the trouble, except in the case of valuable sheep, the best way would be to kill the animal.

In the case of valuable sheep, the veterinarian locates the hydatid and removes it by an operation.

APOPLEXY.—A disease that is generally confined to fat or well-conditioned sheep.

Symptoms.—The sheep leaps frantically into the air two or three times, dashes itself on the ground, then suddenly rises, and dies in a few minutes.

TREATMENT.—

When a fat sheep seems dull and partially unconscious of surroundings; nostrils and pupils of eyes dilated; membranes of the nose deep red or violet; pulse hard and breathing stertorous; apply cold water or pounded ice to the head and give 20 drop doses of Fluid Extract of Belladonna every hour for three or four doses, then once in three or four hours; also give 2 ounces Epsom salts, and follow this with an ounce every six hours till a full evacuation of the bowels is secured.

INFLAMMATION OF THE BRAIN.—Is caused by the same conditions that bring on apoplexy, and is often a secondary effect of that disease. The sheep is dull and inactive; eyes are red and protruding, and as the symptoms become intensified, the animal rushes about in the wildest delirium. The general treatment is the same as in apoplexy.

SWELLED HEAD.—

Causes.—This may arise from a variety of causes—snakes, insects, etc.

TREATMENT.—

In the case of snakes the animal is usually dead; but in case of venomous insects, cut the wool away from the affected parts

and bathe with strong Saleratus water, or Ammonia water, and give internally, if necessary, the following until relieved:

Chloral Hydrate	½ drachm.
Soft Water	1 "

Mix. Repeat every hour as needed.

TETANUS, OR LOCK-JAW.—

Causes.—There are various causes for this trouble, as inflammation after castration, injury to horns and hoofs, or from a wound in any part.

Symptoms.—If able to walk at all, the animal does so with great difficulty; muscles become hard and limbs stiff, the jaws become set, and death generally follows

TREATMENT.—

Medical treatment is of but little avail, the malady being usually fatal. Put the animal in a dark place alone. Then give three times a day 20 drops Fluid Extract Belladonna on the tongue. Warmth and quiet are necessary. When worse symptoms are over, give gruel and soft, nourishing food.

PARALYSIS, OR PALSY.—Paralysis, or palsy, is a diminution or loss of the powers of motion in some part of the body. It is somewhat rare, but sometimes occurs in the case of poor lambs, poor, pregnant ewes, and in those who have just lambed.

Symptoms.—The animal seems to have lost all strength in its loins, and the hindquarters are powerless; it makes ineffectual attempts to rise, but cannot stand on its feet.

TREATMENT.—

Make the animal warm and comfortable. Give warm gruel and a little Ginger as a stimulant. Three times a day give 20 drops Fluid Extract Nux Vomica in a little water, and continue treatment for two or three weeks. If severe, clip off the wool and apply a blister of:

Spanish Fly	1 drachm.
Lard	1 ounce.

Along the spine from hip to shoulder, leaving on 24 hours. In most cases it would be more economical and equally humane to kill the animal at once.

HYDROPHOBIA, OR RABIES.—Sheep are very liable to be bitten by dogs that are wandering in the grip of that dread disease. The dog and all sheep attacked should be killed at once.

INFLAMMATION OF THE EYES, OR OPHTHALMIA.—In cases where there is serious inflammation, apply to the eyes the following wash:

Nitrate of Silver	5 grains.
Soft Water	1 ounce.
Laudanum	15 drops.

Dissolve the Nitrate of Silver in the Water and add the Laudanum.

Bathe eyes with hot or cold water three times a day, and apply lotion with a camel's hair brush twice a day. Equal parts of finely pulverized Boracic Acid and Calomel is good to dust into the eye.

SORE THROAT.—

Causes.—Are similar to those of Catarrh.

Symptoms.—There is swelling and soreness about the throat; the animal stands with nose held elevated, and coughs, flinching as though to save itself; when drinking, the water returns through the nose.

TREATMENT.—

Rub the throat well with stimulating liniment. Feed with soft food placed so that the animal can eat with most comfort. Give the following mixture:

Saltpeter	4 ounces.
Sulphur	4 "
Alum	2 "
Camphor Gum	3 "

Make into paste with molasses and flour, and give a teaspoonful on the tongue three or four times a day.

Steam head as in Catarrh.

BRONCHITIS.—This is an inflammation of the bronchial tubes, or air passages of the lungs.

Causes.—Are the same as those of colds.

Symptoms.—The same as in colds in aggravated form, and attended with more fever, rapid pulse and a tenderness of the throat and belly when pressed upon. Animal will lie down most of the time, and a wheezing sound is heard at the bottom of the windpipe. Normal temperature of sheep is 102°, pulse 45.

TREATMENT.—

Keep animal quiet in a comfortable, well-ventilated place; give cold water in small quantities, with hot mashes and nourishing food. Give as a drench three times a day until better:

Sweet Spirits of Niter.....	¼ ounce.
Fluid Extract of Aconite Root.....	3 drops.
Fluid Extract of Belladonna...10 to 20	"

Mix in a teacupful tepid water, and do not raise head too high, nor allow animal to become choked. After two or three days, drop out Aconite and put 5 drops of Fluid Extract of Digitalis in its place.

If very weak give:

Whiskey.....	4 tablespoonfuls
Ginger.....	1 teaspoonful.
Oatmeal Gruel.....	½ pint.

Repeat three times a day.

2. Bronchitis.—Give salt in doses of from ½ to 2 ounces, with 6 to 8 ounces of Lime Water given at some other time of the day.

FILARIA BRONCHITIS.—

Causes.—This disease is caused by the presence of worms (*Strongylus Filaria*), which are found in the bronchial tubes, the windpipe, and sometimes in the lungs.

Symptoms.—There is a dry, husky cough; quickened breathing, loss of appetite and flesh, and animal will rub its nose on the ground; dysentery with fetid discharges may be present. On examination worms may be found in lower end of windpipe and in the tubes which branch from it.

TREATMENT.—

Give the following:

Sulphate of Magnesia	6 ounces.
Nitrate of Potash	2 "
Sulphur	4 "
Sulphate of Iron	1 ounce.

Mix and give a small handful to each sheep in feed once a day for one week. Wait three weeks and repeat.

Burn Sulphur or Turpentine so sheep will inhale the fumes, giving about the strength that a man could stand.

2. **Filaria Bronchitis.**—Give as a drench every third day until cured:

Turpentine	¼ ounce.
Linseed Oil	½ teacup.

Mix together.

3. **Filaria Bronchitis.**—Inject into the windpipe with a hypodermic syringe the following:

Carbolic Acid	5 drops.
Chloroform	8 "
Turpentine	15 "
Olive Oil	1 drachm.

Insert the needle of the syringe into the windpipe between two of the rings, well toward the upper part, and inject slowly.

INFLAMMATION OF THE LUNGS; PNEUMONIA.—

Causes.—Exposure to sudden cold, or from getting chilled in a cold rain, or from neglected cold in the head.

Symptoms.—Animal is dull and ceases to ruminate; no appetite, but drinks greedily and its breathing is rapid and labored; eye is clouded; teeth are ground together to be heard at some distance; pulse at first is rapid and hard, but intermits, and at last it becomes weak. When fever is at height flanks heave violently; there is a hard, painful cough at first, which becomes weaker and seems more painful in the last stages. If wool is parted on the side and ear placed over the lung, a peculiar grating sound is heard.

TREATMENT.—

Put the animal in a warm, dry, but well-ventilated place, and if recently shorn, cover with blankets, otherwise do not, but avoid drafts. Give the following:

Sweet Spirits of Niter	½ ounce.
Ginger	1 teaspoonful.
Fluid Extract Aconite Root	3 drops.
Fluid Extract Belladonna	10 to 20 "
Water	½ pint.

Repeat three times a day, being careful about choking, and allow plenty of time in taking. After three or four days replace the Aconite with Fluid Extract Digitalis, 5 to 8 drops.

When better, if very weak, give the following stimulant:

Whiskey	2 ounces.
Ginger	1 teaspoonful.
Gruel	½ pint.

Repeat three times a day until sheep is well.

Mashes, water often, but in small quantities, and good care, count for much in the treatment.

SHEDDING TEETH.—While shedding teeth, when from one to two years old, there may be a cap of the grinders sticking on the new tooth, causing trouble in eating.

Symptoms.—Animal does not thrive; seems willing to eat and takes food, but throws it out again; sometimes will be noticed working the tongue around in the mouth.

TREATMENT.—

Examine the mouth, and if there is a cap it will project more than the teeth adjoining. Remove with pincers, and animal will soon be in better condition.

FOREIGN SUBSTANCES LODGED IN THE TEETH.—

Causes.—Sometimes in eating, sticks or other foreign matter get lodged in teeth.

Symptoms.—Acts peculiar and keeps the tongue working around trying to dislodge the offending substance.

TREATMENT.—

Catch and examine mouth, removing whatever is found, either with fingers or pincers.

LOSS OF TEETH FROM AGE.—It sometimes happens that an old ewe that has lost some of her teeth is with lamb, and owing to the fact of having only two or three front teeth she gets thin, and there is poor prospect of her wintering and of yeaning.

TREATMENT.—

Catch the animal and pull out the few front teeth so that her gums may meet, and when healed she will be in condition to carry through. The few teeth interfered with her catching food, and with these out of the way, the gums will meet to take in the food for the grinders, which may be in fair condition.

CHOKING.—

Causes.—Generally from eating sliced roots.

Symptoms.—Animal stops feeding; froths at the mouth; coughs; works its tongue; eyes are blood-shot; sometimes bloating.

TREATMENT.—

Give a swallow or two of melted lard with 20 drops of Fluid Extract of Belladonna, being very careful not to choke, and manipulate the obstruction externally with the hand, to move it up or down. If this plan fails use the probang, as described in the CATTLE DEPARTMENT, using the utmost care and gentleness, or the laceration may cause death, even though the obstruction be removed. If a hollow probang is used, the Lard and Belladonna may be poured through this directly onto the obstruction.

BLOATING, HOVEN, TYMPANITES.—A distension of the paunch by gas, the product of fermentation.

Causes.—From being turned out to clover or other succulent food when the stomach is empty; by eating frozen roots or grass; by chill from a copious drink of cold water.

Symptoms.—Animal is uneasy, keeps getting up and down, and acts distressed. On examination the left side will be found

to be bloated. If the wool over the paunch on left side be separated and the puffed-up surface be tapped with the fingers, it will give back a hollow, drum-like sound.

TREATMENT.—

In ordinary cases prolonged, but gentle driving will effect a cure. The following is also recommended for quick treatment:

Epsom Salts	4 ounces.
Sweet Spirits Niter	½ ounce.
Hyposulphite of Soda ½ to	1 "
Ginger (a drachm equals a teaspoonful)	1 drachm.
Water	1 pint.

Mix and give as one dose.

If not relieved in one-half hour give:

Turpentine	¼ ounce.
Raw Linseed Oil	1 teacupful.

Mix and give as a drench.

If not relieved in one-half hour give as a drench:

Aromatic Spirits of Ammonia	2 teaspoonfuls.
Hyposulphite of Soda ½ to	1 ounce.
Ginger	1 drachm.

Repeat every two hours until relieved.

When animal is swelled almost to bursting and will not move, it is better to open the paunch at once. At the most protuberant point of the distension, on the left side, half way between last rib and hip bone, after having removed the wool, plunge the trocar and canula forward and downward into the paunch. The gas and some of the contents will pass out through the canula when trocar is drawn, and if obstructed by solid matter, push away with a probe. When gas is out withdraw canula. A flexible probang, or in default, a rattan or grape-vine with knot on end, may be gently forced down the gullet and the gas allowed to escape.

IMPACTION OF THE RUMEN, OR PAUNCH.—

Causes.—From the animal getting food that it is not accustomed to, such as grain; and eating an unusually full meal; from a change of pasture, going from a lean to a very good one;

eating a poor quality of peas, straw, or clover hay, especially if musty or over ripe, is said to cause it.

Symptoms.—No appetite; looks dull; grates its teeth; does not ruminate, and has a short, quick grunt in breathing, caused by the food in stomach pressing on the lungs; walks about stupidly; what passages there are, are hard and dry. By pressing the hand on the left side over the stomach, it is found hard; tapping on the spot gives a dull, heavy sound, showing presence of a mass of food.

TREATMENT.—

Give the following to move the bowels:

Epsom Salts	4 to 6 ounces.
Ginger	1 drachm.
Bicarbonate of Soda	1 "
Sweet Spirits Niter	½ ounce.
Water	1 pint.

Give as a drench.

In eighteen hours, if it does not operate, give:

Turpentine	¼ ounce.
Raw Linseed Oil	½ pint.

Mix and give as a drench, and if no relief at the end of twelve hours more, repeat the first dose.

Also give three or four times a day:

Fluid Extract Nux Vomica	20 drops.
Fluid Extract Jaborandi	1 teaspoonful.
Aromatic Spirits of Ammonia	2 teaspoonfuls.

And if much pain, 20 drops Fluid Extract of Belladonna, in ¼ pint of water.

If much weakened give:

Whiskey	1 ounce.
Ginger	1 teaspoonful.
Bicarbonate Soda	1 "

Mix and give in ½ pint of gruel. Repeat three times a day until well.

COLIC—STRETCHES.—

Causes.—Improper food; from drinking cold water.

Symptoms.—The animal will be seen lying down and rising every moment or two, and constantly stretches the fore and hind legs so far apart that the belly almost touches the ground. Sometimes when lying on the ground it will strike its feet up against the belly. Appears to be in pain, and will not eat.

TREATMENT.—

The following is recommended in such cases:

Epsom Salts	½ ounce.
Jamaica Ginger	1 drachm.
Essence Peppermint	60 drops.

Or:

Fluid Extract Jaborandi	1 teaspoonful.
Fluid Extract Nux Vomica	20 drops.
Fluid Extract Belladonna	15 "
Aromatic Spirits Ammonia	2 teaspoonfuls.
Water	½ pint.

Repeat in one hour if necessary.

The salts alone may effect a cure, or an equivalent dose of Linseed Oil may be given.

INFLAMMATION OF THE BOWELS.—Not an uncommon disease among young sheep.

Causes.—From chill from over exposure; eating foul pea straw; from eating too much snow; or irritating food of any kind.

Symptoms.—There is severe, continuous distress, causing the animal to lie down, and then immediately get up again, only to do the same over and over again; pawing with one foot and then with another. The ears and extremities are cold, and pressure on the belly causes the animal to moan as in pain. Temperature elevated, pulse hard and rapid. There are no cessations as in colic pains.

TREATMENT.—

Give the following drench:

Laudanum	¼ ounce.
Tincture Aconite Root	3 drops.
Fluid Extract Belladonna	15 "
Raw Linseed Oil	½ pint.

Turn the animal on its back and rub in on its belly where the wool is short, ¼ pound Mustard wet up with vinegar. Afterward grease where it is blistered. If a ram, be careful to not get the paste around the point of the sheath. Repeat remedy every two hours until relieved, but after first dose leave out the Linseed Oil.

STOMACH WORMS.—That sheep are troubled with worms more than the ordinary grower imagines is beyond question, but unless present in large quantities they do not affect the animal enough to cause attention. Lambs under one year old suffer most from this parasite.

Symptoms.—The affected animal becomes unthrifty, runs down in flesh, does not grow, although the animal eats well; gets weak, hard for it to follow the flock, and at last is apt to have diarrhea.

It is necessary to hold a post mortem to determine this disease for a certainty, and if these worms are present they will be found in the fourth stomach. They are small, only about ¾ of an inch in length, and of a reddish color, so may be overlooked. If a number of animals in a flock are unthrifty it is always best to destroy one and hold a post mortem to determine which of these parasites are present, and treat the entire flock. The sooner treatment is commenced the more successful it will be.

TREATMENT.—

As a preventive use in the salt, when salting the sheep, a mixture composed of equal parts of Sulphate of Iron and Sulphate of Copper. Add about 1 ounce of the mixture to the salt required for each 40 sheep. A good worm drench that is simple is the following:

Turpentine..... ¼ ounce.
Linseed Oil..... 4 ounces.

Mix and give as one dose, after fasting the animal eighteen hours.

The following is also effective:

Gasoline	1 tablespoonful.
New Milk	4 ounces.

Mix and give after fasting animal eighteen hours, and repeat each second day until three doses have been given.

From 2 to 4-ounce doses of a 1 per cent. solution of Coal-Tar Creosote is also good. A 1 per cent. solution is: Coal-Tar Creosote, 1 ounce; water, 3 quarts.

Sheep affected with this parasite should receive grain, and it is good to give with this a mixture of equal parts of Sulphate of Iron and Sulphate of Copper. The dose of the mixture is one ounce for each 30 to 40 sheep; dissolve in a pint of water and mix evenly with bran or oats. Give once or twice a day as case requires. Give two weeks, withhold a week, and give again. This may be used in connection with the foregoing. It is good to use occasionally with the flock as a preventive.

TAPEWORMS.—The tapeworm is more common among sheep than stock owners are generally aware, and their presence may not be suspected unless accidentally found, or the sheep fall off in condition, and the worm found by post mortem. It is most common among young sheep but may affect the older ones. The exact source from which sheep get tapeworm is not known. They are found in the small intestines.

Symptoms.—Animal falls off in condition and the eyes have a peculiar, dull, look; has a good appetite but does not thrive; may be thrown into convulsions and die in a short time. When these conditions are present, watch the droppings for the presence of tapeworms, and if flat joints ½ inch long come away, the trouble is probably found. The post mortem is important here, the same as in the preceding disease.

TREATMENT.—

Shut the affected sheep by themselves, where they can be watched, and let them fast eighteen hours. Then give each affected sheep the following drench:

Oil Male Fern	1 teaspoonful.
Areca Nut Powder	2 teaspoonfuls.
Turpentine	1 teaspoonful.
Raw Linseed Oil, or New Milk	4 ounces.

Shake while giving.

Feed lightly and watch results. Should there be no action, repeat in two or three days after another eighteen-hour fast. Give lambs ½ the above dose.

NODULAR DISEASE.—This is another internal parasitic disease of sheep and lambs. It is characterized by the presence in the walls of the intestines of small nodules varying in size from a small to a large pea. When cut open the nodules are found to contain a greenish, cheesy pus. The nodules are caused by an immature worm. After remaining in the nodule for a time, they return into the intestine and develop into a mature worm about ¾ of an inch long. When the nodules are few in number they cause no harm; but when present in large numbers they cause serious inflammation of the intestinal wall and interfere with digestion.

Symptoms.—The outward symptoms will be the same as with stomach worms; it takes the post mortem to distinguish between them.

TREATMENT.—

The treatment is less satisfactory than with the others. The same as recommended for stomach worms may be used; also use the same preventive measures.

Sheep should not be kept on low pastures, or on the same pasture continuously—or year after year, but change pasture as often as possible during the summer, and upon different fields from year to year. Wean the lambs early, and place them on a pasture where the old sheep have not been kept.

DIARRHEA.—Diarrhea or scours ordinarily manifests itself by the amount and watery condition of the discharges.

Causes.—Are generally due to improper food, as bad hay or noxious weeds; or to a sudden change from dry food to green; to overfeeding, or to cold, wet weather; also to internal parasites.

Symptoms.—In simple form the thin, watery discharge is about the only prominent feature. The appetite is usually good, though it may be poor; there is no apparent fever, and the general conditions remain unchanged.

TREATMENT.—

When light and not long-continued, no remedy is called for, and confinement to dry food for a day or two often cures. With lambs in the fall it is more serious. If severe, and if mucus is present in the feces, give a mild cathartic, as, Rhubarb ½ drachm; or 1 ounce Linseed Oil; or ½ ounce Epsom Salts. Then give an astringent, as 15 to 30 grains Sulphate of Iron, and in most cases this will be enough. If not give:

Prepared Chalk..... ½ ounce.
Laudanum..... 3 to 4 teaspoonfuls.
Tepid Milk..... ½ pint.

Mix and give twice a day for two or three days, which in ordinary cases will suffice.

Or, in more serious cases prepare the following:

Castor Oil..... ½ teacupful.
Laudanum..... ¼ ounce.
Ginger..... 1 drachm.
Bicarbonate of Soda..... 1 "
Tepid Water..... ½ teacupful.

Mix and give as a drench. Repeat, omitting the Castor Oil, every three hours until relieved. In very bad cases, add to the drench ½ ounce Tincture of Catechu.

DYSENTERY.—

Causes.—This is caused by an inflammation of the mucous or inner coat of the intestines, causing an abnormal increase in the secretions and a morbid change in character. It is frequently a sequence to diarrhea and arises from the same cause.

Symptoms.—There is fever; appetite is variable, but generally none; the discharges are thin and watery, but adhesive from presence of mucus. As disease advances the feces are tinged with blood and the odor is very offensive. Unless relieved the animal wastes away.

TREATMENT.—

Use the last preparation recommended for diarrhea, and alternate with it a teaspoon nearly half full of Sulphate of Iron (copperas) dissolved in ½ pint of water.

Give teaspoonful doses of Blood Flour, or

Corrosive Sublimate..... 4 grains.
Water.....½ pint.
Dose ½ to 1 teaspoonful every three or four hours.

This last is very poisonous, and due care must be taken in its use.

FLUKE DISEASE IN SHEEP; ROT, OR LIVER FLUKE.—

Causes.—Small flat worms (Fasciola Hepatica and Distoneum Lanceolatum) in the liver, called the "liver fluke," are the cause of this disease.

Symptoms.—There is tenderness and weakness about the loins; dropsical swellings come under the jaws, on throat, chest and belly; eyes are yellow as in jaundice, and if the skin be rubbed back and forth, when taken up between the thumb and fingers, it is soft and flabby, with a crackling sensation.

TREATMENT.—

If there is diarrhea, weak pulse and general stupor, remove to a high, dry pasture, or to a dry, well-ventilated place. Prepare and give the following:

Sulphate of Magnesia..... ½ pound.
Turpentine..... 6 drachms.
Water.....1½ pints.
Mix Magnesia with the Water and add the Turpentine. Give one-third of the amount for a dose every two days, shaking the bottle each time.

Follow this with tonic:

Oatmeal..... 40 pounds.
Powdered Gentian..... 4 "
Salt..... 4 "
Sulphate of Iron..... 1 "
Mix and give ½ pint to each sheep once a day for a week. Wait three weeks and repeat.

High, dry pastures and salt marshes are destructive to the fluke, while low, wet pastures favor the perpetuation of the disease. This disease is uncommon, except in a very few sections of this country.

GRUBS IN THE HEAD.—What is known as "grub" is the larvae of the oestrus ovis, or gad-fly of the sheep. The young larvae is deposited by the fly about the nostrils, passes up the nasal cavities into the sinuses just below the eyes. This takes place in July, August and September. The larvae remain in the sinuses until the following spring, when they descend and pass from the nostrils and enter the ground, change their form, and in three or four weeks come forth as the adult fly. The grubs cause but little irritation unless a number are present in the sinuses, when their presence may be indicated by sneezing, discharge from nose, dullness. When the flies are troubling the sheep, their presence may be known by the action of the animals. They will collect in clusters, with heads inward and noses thrust toward the ground, and into it if any loose earth is available.

TREATMENT.—

Preventive treatment is probably the best treatment that is available to the layman. Keep a portion of the field plowed—at least a furrow—so that sheep may have access to loose soil. Smear the noses once a day during the season with Tar and Fish Oil. An old remedy to dislodge grubs is:

Scotch Snuff ..... ½ pound.
Boiling Water..... 2 quarts.

Stir and let cool. Inject a tablespoonful of this liquid into each nostril, and repeat three or four times from October to January.

An easy and fairly effectual way to get the tar onto the nose is to bore a number of large auger holes in a log; put salt in the bottom of the holes. After the sheep get to going to the log for salt, put Tar and Fish Oil around the holes, and it will get onto their noses.

SCAB.—

Cause.—Scab is a cutaneous disease, analogous to mange in horses and itch in man. It is produced by a microscopic insect that burrows just beneath the cuticle, producing much irritation, and causing the exudation of a watery fluid, which in drying forms the scab that brings away the wool in larger or smaller patches.

Symptoms.—Sheep suffering from scab are exceedingly restless; rub themselves constantly against trees, stones, fences, etc.; will bite its fleece and scratch with its hoofs; the fleece becomes ragged and drops off. It is very contagious.

TREATMENT.—

A very cheap and effective remedy is:

Creolin..... 2 teaspoonfuls.
Rain Water..... 1 pint.

Shake well and go all over the body of the animal with a brush. Repeat every second day until the disease stops and the wool begins to grow.

Or the following, which is in great repute in Australia:

Tobacco Leaves..... 10 pounds.
Sulphur..... 10 "
Water..... 60 gallons.

Boil the Tobacco in the water and add the Sulphur while water is hot. Dip the sheep in liquor as hot as can be borne for five minutes.

Lime and Sulphur Dip for Scab.—Take 8 to 11 pounds unslaked Lime, place in mortar box, kettle or pail, adding enough water to form a paste. Sift into this 3 times its weight of Sulphur (24 or 33 pounds) and stir mixture well. Weigh both; don't guess or measure. Now place in a boiler or kettle with 25 to 30 gallons boiling water, and boil at least two hours, stirring well together. Pour all into a tub or vat that is provided with a bung-hole about 4 inches from bottom, and allow ample time to settle. Draw off the clear liquid and add enough water to make 100 gallons. As a precaution draw off through bagging, so there will be no sediment in clear liquid. The sediment may be used for disinfecting purposes, but under no circumstances should it be used for dipping.

Use the smaller amounts of ingredients in fresh cases and the larger in severe cases. Dip sheep at a temperature of 100 to 110 F., keeping them in two minutes by the watch, ducking the head at least once. Rams are more apt to be overcome in the dip than ewes. Be careful about pregnant ewes, as injury may result. Repeat dip in ten days.—*From U. S. Bulletin.*

The various coal-tar dipping products which are on the market are fairly effectual. All dips should be repeated in ten days.

Affected sheep should be separated from the healthy and stables thoroughly cleaned and treated with the dipping fluids.

WOOL FALLING FROM SHEEP.—

Causes.—Feeding too much hot food, as pea or wheat meal, and keeping in too warm quarters.

Symptoms.—In spring, wool becomes loose and falls off in patches; sheep will rub some, but shows little signs of irritation.

TREATMENT.—

Is largely in changed conditions. Put in cooler quarters and change the food to roots, such as mangels and grains of a lighter character, to cool the blood. In severe cases give the following powder once a day for a while in doses of one teaspoonful to each sheep: Saltpeter, Sulphur and ground Gentian Root, equal parts of each by weight. Mix and give as directed.

TICKS.—The sheep tick is a winged insect, but has no wings developed. Are large, live on the surface and suck blood. They may be plainly seen by dividing the wool, or, at the time of shearing, at which time they will go to the lambs.

TREATMENT.—

The tobacco remedy in "Scab" may be used, or put 2 tablespoonfuls Creolin in a pint of water, and go over the animal with a brush. The Coal-Tar dipping preparations are very effectual here, dipping the sheep the same as in scab. One treatment is generally sufficient, but sometimes requires a second in about two weeks.

MAGGOTS FROM BLOW FLIES.—Maggots are more common than they should be, both in neglected wounds and from the accumulation of filth about the thighs.

TREATMENT.—

Cleanse parts thoroughly and touch wounds with the following lotion:

Creosote	1 part.
Alcohol	4 parts.

Mix. Then bathe daily with Tincture of Myrrh.

Or, remove all maggots and dress wounds with following:

Acetate of Lead	1 ounce.
Sulphate Zinc	½ "
Carbolic Acid	½ "
Water	1 pint.

Shake and apply freely.

Keep sheep well tagged by shearing from under the tail, and thence diagonally down the thighs

FOOT ROT.—

Causes.—A contagious disease caused by a micro-organism.

Symptoms.—Skin at the top of the clefts of the hoofs and over the heels, which normally is smooth, dry and pale, becomes red, moist, warm, and rough, as though chafed. Next, there is a discharge, and ulcers form extending down to the upper portion of the inner wall of the hoof. The walls become disorganized, and the disease penetrates between the fleshy sole and the bottom of the hoof, an offensive, purulent matter is thrown out, and the whole foot becomes a mass of corruption. Animal early becomes lame, and at length dies from exhaustion.

TREATMENT.—

Separate the affected sheep and put them in a dry, well-littered yard, or dry, short pasture. Cut away all diseased parts, cleaning knife from time to time in a solution of Carbolic Acid. Prepare a tank, and fill it to the depth of four inches with a saturated solution (all that will dissolve) of Blue Vitriol (Sulphate of Copper). Keep this as hot as can be borne by putting in from time to time a piece of hot iron. Let each sheep stand in this ten minutes. Then cover the hoof with Chloride of Lime and fill the cleft with a fillet of tow, long enough to twist and

tie ends about fetlock. Examine daily and renew lime if necessary. It is necessary sometimes to apply a caustic to the worst spots; Muriatic Acid is good for this; it can be used full strength, or diluted with one or two parts of water, as conditions require. It must be applied carefully with a swab. The disease is frequently hard to overcome, and will reappear from time to time. Feed good nourishing food, and if a tonic is needed give the following powder once a day, as circumstances dictate:

Common Salt	2 drachms.
Sulphate of Iron	½ drachm.
Nitrate of Potash	½ "

Mix.

FOUL IN THE FOOT.—This is not an uncommon difficulty, especially with sheep driven on the road or pastured on low, marshy pastures.

Symptoms.—Much like previous disease, only not so severe.

TREATMENT.—

If inflammation is severe, poultice with Linseed poultice, changing twice a day. Apply the Sulphate of Copper solution, or:

Acetate of Lead	1 ounce.
Sulphate of Zinc	6 drachms.
Carbolic Acid	½ ounce.
Water	1 pint.

Shake and apply freely after washing.

The Muriatic Acid may need to be used in bad cases, as in "Foot Rot."

SWOLLEN FOOT;—DISEASE OF THE BIPLEX CANAL.—

Causes.—From the introduction of foreign bodies, or from other reasons.

Symptoms.—The issue or biplex canal in the front and upper part of the hoof becomes inflamed; there is redness and enlargement around the pastern, particularly about the orifice of the canal, and the toes are thrown wide apart.

TREATMENT.—

Examine to see if there is any substance lodged therein; if so, remove. If simply swollen and inflamed, treat as for "Foul;" if pus has formed, open and let it out. Wash out with:

Carbolic Acid	½ ounce.
Water	1 pint.

And inject a little of the Tincture of Iodine. Continue poulticing and dressing each day. If it refuses to improve, use the Muriatic Acid in addition to the other treatment, and also the Lead and Zinc lotion, or the Copper solution.

FRACTURES.—If there be no wound of the soft parts, the bone being simply broken, the treatment is not difficult, and in case of a valuable animal would pay trouble and care. Apply a piece of wet leather, taking care to ease the limb when swelling intervenes; or, after setting the bones, apply a long bandage saturated with starch, the same as for the laundry, but in taking out draw through the fingers to squeeze out a good portion to allow it to dry quicker; then wind it around the broken leg moderately tight, being sure to have the bones set straight; then have some one hold the animal and keep the leg in shape till the bandage hardens, and after this let remain for a month or more. Examine leg, and if it gets too tight or becomes sore, cut off and put on a new one. Remove when sheep is well Keep the sheep in a small enclosure by itself, where it will be disturbed as little as possible.

SPRAINS, STRAINS AND BRUISES.—

TREATMENT.—

Treat precisely as advised in HORSE DEPARTMENT. In simple cases hot fomentations and the subsequent application of Camphor or other good liniment is the rule generally followed. For a sprain, to immerse the limb in water as hot as can be borne for half an hour at a time, and repeated several times a day, will usually effect a quick cure.

INFLAMMATION OF THE TESTICLES.—

Causes.—A kick, or a bunt from some other animal.

Symptoms.—The scrotum is swollen and tender; ram walks stiffly; does not eat much, and lies down most of the time to relieve the pain caused by standing.

TREATMENT.—

Separate the ram from the flock and put him in a quiet place. Apply hot poultices—half meal and half bran. Change every 3 hours, and each time before a new one is applied, bathe the part with hot vinegar, or with the Lead and Zinc lotion recommended for Foul in the Foot. Witch Hazel extract is also good to bathe with. Also give the animal the following drench:

Epsom Salts	4 ounces.
Fluid Extract Belladonna	30 drops.
Saltpeter	1 small teaspoonful.
Water	½ pint.

Repeat three times a day, omitting the Salts after the first dose.

Wash the scrotum with Carbolic Acid solution:

Carbolic Acid	½ ounce.
Water	1 pint.

In case the bag festers, lance when ready and let the matter come away, and wash out with Carbolic Acid water. Continue poulticing until all the matter is drawn out and the ram is better, but after the inflammation is well reduced, poultice only about one-half the time.

CASTRATING RAMS.—Throw the ram and have him held firmly; take a sharp knife and make an incision lengthwise of the scrotum, on what would be the rear surface when ram is standing, near the bottom so that no pocket will form. Cut the hole large enough so that the testicle will slip out easily, and when out the place where the covering is attached to the testicle will be seen. Cut this attachment with the knife, pull the testicle up 3 or 4 inches and tie a pretty strong string around the cord, tying it tight enough to stop the blood, leaving the ends of the string 4 or 5 inches long so they will hang out of the incision, and not heal up in the scrotum. They will come away after a few days without assistance. As soon as this is done, cut

the cord off ½ inch below the string; then operate on the other testicle in the same manner. Pour into the wound a little of the Carbolic Acid solution:

Carbolic Acid	½ ounce.
Water	1 pint.

Have a dish of Carbolic solution to put the knife in before using and when not using it during operation; also for string.

If there is swelling, open the incisions and flush out daily with the Carbolic solution. Do not allow the animal to get wet.

CASTRATING LAMBS.—Lambs should be castrated at from 2 to 10 days of age. An assistant should hold the lamb, turning him on his back, holding rump between his knees with head toward himself, taking the fore and hind legs in each hand with fore legs outside of hind, and holding them firmly just above the knee joints. Take hold the pouch and pull gently so to get as much as possible of it, and then with a sharp knife and a single stroke, or better, with a pair of strong shears, take off the pouch close to the testicle. Then take firm hold of each testicle, separately, between thumb and finger and pull it out with all the cord that adheres to it, or pull out a ways and cut cord off. Perform in the morning so that lambs can go about, and this will in great measure prevent any disposition to swelling, which would be the case if allowed to lie around for a time afterward. Use the Carbolic Acid solution the same as with the ram.

DOCKING.—Docking, like castration, should be performed when lambs are a few days old. Perform with a single stroke of a sharp knife and in the evening, being careful to sever the tail at a joint, the assistant drawing the skin of the tail to the body so that the end will cover the stub. Then allow the flock to lie down and keep quiet so that they may lose the least possible amount of blood. By morning the wound will have dried sufficiently that there will be little danger of bleeding. Never exert after docking. If much bleeding ensues apply a little Monsel's solution, or touch lightly with a hot iron.

LAMBING.—The ewe goes with young from 145 to 162 days, generally stated as five months. Ewes are usually coupled in the month of November in the north, but this is varied somewhat by circumstance and purpose. A good way to tell whether a ewe has been served is to shake dry paint on the ram's breast, and when he has served the ewe the paint will be on her back.

After about the third month in young ewes and fourth in old ones, the udder will begin to enlarge, and will continue to grow larger until a few days before she drops the lamb. The predisposing signs are, when the ewe stretches herself frequently; separating herself from the rest; showing restlessness by not remaining in any one place long; lying down and then getting up again; pawing ground with the foot; bleating as if in quest of a lamb, and appearing fond of the lambs of other ewes. Very soon after these symptoms is the immediate one of the expulsion of the water bag. When this is observed the ewe should be watched, for labor pains may be expected to come on at once. When these are felt by her the ewe presses or forces with earnestness, changing from one position to another as if desiring relief.

TROUBLES MET WITH IN LAMBING.—The ewe does not often require assistance. Her labors will sometimes be protracted, and her moaning evince the extent of pain. In some cases will even go about several hours, and resume her grazing with the fore feet and nose of lamb protruding. If left alone, however, nature will generally relieve her. The objection to interfering, except in necessity, is that the ewe is frightened when caught, and her efforts to expel the lamb cease.

Sometimes wrong presentations are made, and the attendant should be ready with Carbolized Lard, clean hand, oiled and warmed in warm water to render assistance, inserting his hand, pushing back, and changing as case requires. Sometimes the lamb comes with feet out but head turned back, in which case the head must be brought forward after pushing lamb back; then draw on head and legs and it will come right. If coming with only head and neck out and front legs turned back, push lamb back into womb, straighten the legs, drawing gently on them and the head. If coming with only head and one front leg out, push

back into womb and straighten the other front leg; bring front legs and head gently forward. Sometimes there are twins, and a leg of each will come forward; in which case in straightening, be sure the two legs of one of the lambs are straightened out before assisting presentation, or injury may result. A case of breech presentation may occur, where the ewe will labor and nothing is accomplished—the tail and rump only are felt in passage, and the hind legs are turned forward along the lamb's body. Push lamb back into womb and hook a finger around one of the hind legs and bring it backward toward you until straight out in passage; then do the same with the other; then draw out backward. Don't try to turn a lamb. Be gentle and careful not to injure womb. In case of trouble from neck of womb remaining closed give;

Fluid Extract Belladonna..... 15 drops.
Tepid Water ..... ½ pint.

Repeating every two hours until the neck relaxes, and smear mouth of womb with a little Belladonna in Lard.

If a lamb is dropped at night and gets chilled, put it in a warm bath, dry thoroughly after, and give it a few spoonfuls of milk, diluted a little and sweetened, with a speck of Red Pepper in it.

THE CLEANING, OR PLACENTA, NOT COMING AWAY.—The cleaning, or placenta, generally drops from the ewe in the course of a very short time—sometimes in a few minutes—after lambing. In case it does not, give the ewe a warm drink, and leave her alone; then if it does not come away after a time, give a drench as follows:

Epsom Salts..... 4 ounces.
Sweet Spirits of Niter..... ¼ ounce.
Fluid Extract Belladonna..... 15 drops.

Mix and give in a pint of tepid water.

The protruding mass may be gently pulled upon.

EVERSION OF THE WOMB, OR LAMB BED TURNED OUT.—It sometimes happens that by reason of violent after-pains, the womb is forced right out through the vagina, and is turned inside out.

As soon as this is known, if there is any cleaning attached to the button-like processes, remove, then bathe with cold water, having placed the womb on a sheet to keep it clean. When thoroughly cleaned, pour over it a solution of Carbolic Acid:

Carbolic Acid	1 teaspoonful.
Water	1 pint.

Have the hind part of the ewe elevated, and, having the hands well oiled, start returning by beginning at the vulva and keep working until all is in the passage; then push it back into normal position. Put three good, deep stitches in the vulva, to prevent eversion again, but leave sufficient space for animal to make water. Leave stitches in for from four days to a week.

In case straining is severe and continues, give internally:

Laudanum	¼ ounce.
Fluid Extract Belladonna	30 drops.
Water	½ pint.

Give 4 ounces Epsom Salts as a laxative; feed very lightly. Do not let lamb suck if he butts.

Also give:

Fluid Extract Aconite	3 drops.
Fluid Extract Belladonna	20 "
Saltpeter	½ teaspoonful.
Water	½ pint.

Mix and give three times a day for four or five days.

INFLAMMATION OF THE UDDER (GARGET.)—This is an inflammation of the udder, somtimes known as "caked bag," with or without general inflammation.

Causes—Generally from too great an accumulation of milk prior to lambing, but may be in consequence of the death of the lamb, or from a cold.

TREATMENT.—

Draw the milk from the udder so that the hungry lamb will butt and work at it an unusual time in pursuit of food, and bathe it a few times with hot water. This will usually suffice. If the lamb is dead, the milk should be drawn a few times at increasing intervals, bathing the udder for some time with hot water after each milking. In severe cases the udder should be anointed with:

Strong Spirits Camphor	3 parts.
Turpentine	1 part.

Witch Hazel is good or Camphorated Oil. Give 4 ounces Epsom Salts, also ½ teaspoonful Saltpeter two or three times a day.

Should there be suppuration, the affected part should be opened and washed out with a Carbolic Acid solution.

DISEASES OF YOUNG LAMBS

WEAKNESS.—

Causes.—Sometimes where the ewe is not properly fed and taken care of; or where there are twins; or from coming on a cold night and getting a chill, the lambs are weak and unable to stand.

TREATMENT.—

If from a chill, put it in a warm bath, dry thoroughly afterward by warmth and rubbing; then give in a tablespoonful of the ewe's milk, a teaspoonful of Whiskey and repeat every hour until strong enough to take the teat.

CONSTIPATION.—

Causes.—From being fed with cow's milk, especially when not diluted with water and sweetened, and from causes unknown.

Symptoms.—The lamb is dull, and there is some distension of the sides; there is straining to move the bowels, but no passage.

TREATMENT.—

Very young lambs are subject to a disease that is sometimes called "pinning," the first passages being so adhesive and tenacious in their nature that the orifice to the anus is closed and subsequent evacuations prevented. In such cases remove the adhering matter, rubbing with a little dry clay to prevent further trouble. If from food or other causes, give Linseed Oil in teaspoon to tablespoonful doses two or three times a day until bowels are in condition. Epsom Salts in ½ to 1 drachm doses may also be given. Injections of soapy, lukewarm water may also be given in ½ teacupful quantities one or more times a day.

DIARRHEA IN LAMBS.—

Causes.—From milk not agreeing, or from a chill.

TREATMENT.—

Put a teaspoonful of Whiskey and one of Castor Oil in a tablespoonful of the ewe's milk and give it from a small spoon, being careful in administration. In four hours if not better, give 5 drops Laudanum in a teaspoonful of Whiskey, together with a tablespoonful of the mother's milk. Repeat every four hours until relieved. Keep lamb warm and comfortable, and see that the ewe is kept milked out, to prevent garget. See also "Diarrhea" in other part of this department, which may be adapted to conditions. Part of a teaspoonful of Blood Flour in a little water is good. Part of a teaspoonful of cooking soda is also good.

Note.—Sheep may be affected with other diseases not mentioned here but described in the HORSE or CATTLE DEPARTMENT. In such cases they would be treated the same as there, except that the doses of medicine would be about 1-6 that for cattle and 1-3 that for horse.

SWINE

DISEASES AND THEIR TREATMENT

WAYS OF GIVING MEDICINE TO SWINE.—A common way is to put a noose on the upper jaw and draw up the head. Use horn or bottle in giving liquids. Sometimes the struggles do harm, and care must be used to not strangle by pouring too fast—take time. Another way which has high recommendation is: Pull the cheek away from the teeth so as to form a pouch, and pour the medicine into this slowly; the animal will quit squealing when he finds out what it is, and will begin to swallow. Put the hog in a chute where he cannot turn around, and give him a shoe which has a hole in the toe to bite on. The medicine is poured in the shoe and taken while he is biting on it; or a short piece of hose with a funnel attached to one end. Still another plan is to take a board 8½ inches wide by 10 to 12 inches long, which includes handle cut down at one end. About 3 inches from one end cut a notch 1¾ inches deep and 3 inches wide. Opposite the middle and on the other edge, cut another notch an inch square; then cut away for a handle. Let one hold while another drenches; catch by ears and set back on hind-quarters, place the board in mouth with small notch down, pour from a strong bottle, in the front of mouth, on the end of the tongue. Vary size of board to animal.

Medicine in the form of small powders, pills, or paste, may be placed well back on the root of the tongue.

DISINFECTION AND DISINFECTANTS.—The disinfection of places where animals having malignant or contagious diseases have been kept should be rigorously carried out. Every part should be stopped tight, and Sulphur and Wood Tar, in the proportion of 1 of Sulphur to 2 quarts of Tar, mixed with tow, should be burned and allowed to smoke thoroughly until the building is thick with the smoke. Places where sick animals

are should be fumigated two or three times a week, but not so much as to set sick animals to coughing. All parts of the building should be wet with Carbolic solution, either by sprinkling or washing, using in proportion of 100 parts of soft water to 3 parts of Carbolic Acid. Discharges should be treated with Chloride of Zinc, using in the proportion of 1 ounce of Chloride of Zinc to 1 to 2 gallons of water. Chloralum is a disinfectant that is not poisonous and has no odor. It is made by dissolving 3 pounds Chloride of Aluminum in 2 gallons of water. A cheap and powerful disinfectant that is non-poisonous is made by dissolving 8 ounces Chloride of Zinc and 16 ounces of Sulphate of Iron in one gallon of water. Add 1 pint of this liquid to 1 gallon of water. Another cheap and very powerful disinfectant is Corrosive Sublimate, one part to one-thousand parts of water, 1 drachm of Corrosive Sublimate to 1 gallon of water. It corrodes metals and so must be made and used from wooden vessels. It is poisonous and must be used with due care.

HOG CHOLERA AND SWINE PLAGUE.—These two diseases—which have caused such widespread devastation among the swine all over the country—resemble each other very closely both in their symptoms and in their effect on the bodies of animals; so much so in most cases that an after-death examination by experts would be necessary to clearly distinguish them. The difficulty of distinguishing between the two diseases is of no great consequence from a practical standpoint, as in either case they must be combatted by measures to prevent exposure, or to destroy them when introduced, and sick animals must be treated by remedies that will reduce fever, stop multiplication of germs, and assist the affected organs in resuming their normal functions.

Symptoms.—The symptoms of the serious diseases of swine are not so characteristic as in larger animals. Animals often die before sickness has been observed, or after a few hour's illness. Such cases are most frequent at the first appearance of the diseases, but in many cases the progress of disease is slower and ample opportunities are allowed for studying the symptoms. There are first seen signs of fever, shivering, unwillingness to move, more or less loss of appetite, elevation of temperature

which may reach 105 to 106 F.; the animals appear stupid and dull, and have a tendency to hide in the litter or bedding or to remain covered by it. The bowels may be normal or constipated at first, but later there is generally liquid and fetid diarrhea, abundant and exhausting, that persists to the end. The eyes are at first congested and watery, but soon the secretion thickens, becomes yellowish, accumulates in the angles and gums the lids together. The breathing is more rapid than usual and may be oppressed and labored in the later stages. There is a cough, which however is not very frequent and is generally heard when the animals are driven from their bed; it may be single and it may be paroxysmal. The skin is often congested and red over the abdomen, inner surface of the limbs, under surface of the neck, and on the ears. The color varies from a pinkish red to dark red or purple. An eruption is sometimes seen, which leaves crusts or scabs of various sizes over the skin. There is rapid loss of flesh; the animal grows weak; stands with an arched back and the abdomen drawn up, and walks with a tottering, uncertain gait; there is less and less inclination or ability to move, and the weakness and exhaustion increases until death results.

The symptoms of swine plague in many instances are not noticeably different from those of hog cholera. Frequently the lungs are extensively inflamed in swine plague, and in that condition the breathing is more labored and the cough more frequent and painful.

The course of these diseases varies from one or two days to two or three weeks.

TREATMENT.—

When the hogs are first found to be infected with either hog cholera or swine plague, the lots or pens where they have been confined should be disinfected by dusting plentifully with dry, air-slaked lime or by sprinkling with a 5 per cent. solution of crude Carbolic Acid. The animals should be moved into new quarters. If possible, the sick and well should be separated and put into different lots. They should be put into dry, clean places where there is no mud, and above all, no stagnant water. Keep well disinfected by the use of air-slaked Lime or Carbolic Acid.

Give·

Wood Charcoal	1 pound.
Sulphur	1 "
Sodium Chloride	2 pounds.
Sodium Bicarbonate	2 "
Sodium Hyposulphate	2 "
Sodium Sulphate	1 pound.
Antimony Sulphide (Black Antimony)	1 "

Pulverize and mix thoroughly.

In case there is profuse diarrhea the Sodium Sulphate may be omitted.

Dose: 1 large tablespoonful for each 200 pounds weight to be treated, once a day.

Hogs affected with these diseases should be fed at least once a day with soft feed, such as bran and middlings, middlings and corn meal, or ground, soft oats and corn, or ground oats and corn, or crushed wheat with hot water, and then stirring in proper amount of medicine. If unable to eat, drench by pulling the cheek away from the teeth so as to form a pouch, into which the remedy may be slowly poured. It will flow into the mouth, and when the hog finds what it is, it will stop squealing. Apparently this remedy has been more efficacious in cholera than in plague. The best of care must be given in addition to this in order to secure the best results. As a preventive, put the remedy into the feed of the herd and see that each one gets his share.

Notes.—Both hog cholera and swine plague are caused by bacteria, the hog cholera germs being slightly larger and more elongated than those of swine plague. They are provided with long thread-like appendages, which enable them to move rapidly through liquids, while bacteria of the swine plague have no such organs, and are unable to move except as carried by the liquid in which they float. The germs of cholera gain entrance through food and drink and the air as well, while those of the plague gain entrance through the lungs. Cholera germs are hardy and vigorous, living and multiplying for a long time in water or soil, while those of the plague are delicate and easily destroyed.

When several animals are affected with the symptoms in the neighborhood, we may decide that one or both diseases are present. If button-like ulcers are found on the intestines, the disease is no doubt cholera, though in acute cases they will not be present. If there be inflammation of the lungs, and particularly if cheese-like masses be found in the substance of these organs, the disease is probably swine plague. Small blood spots in the tissues or scattered over the internal organs indicates hog cholera, while inflammation of the serous membranes—the membranes lining the closed cavities of the body—indicates swine plague. In hog cholera there are hemorrhages in the tissues, in the lymphatic glands, and in the various organs of the body; ulceration of the large intestines, collapse of the lung tissue, and less frequently broncho-pneumonia. In swine plague there is inflammation of the lungs, numerous small necrotic points in these organs, or a few larger cheesy masses; inflammation of the serous membranes with fibrinous deposits; congestion of the mucous membrane of the intestines, or inflammation of the same with fibrinous deposits.

In times of plague or cholera remember that non-intercourse is the safest rule. A particle of dirt carried on a shoe, by a dog or other animal, or on the wheel of a wagon, will be sufficient to start an outbreak.

When there is reason to fear an outbreak, hogs should be shut in a small enclosure, kept as dry as possible—for it is certain that if filth is not the cause, it will greatly facilitate it—and disinfect at least once a week as directed. Three to 15 drops of Carbolic Acid, according to age, in the drinking water will tend to prevent infection. Also keep hogs thrifty and vigorous by using the prescription recommended for Chronic Indigestion.

Measures of Prevention.— Promptly destroy and bury deep all animals that are known to be sick of the plague, and disinfect the premises, or if impracticable, remove other animals to high dry ground—if fresh plowed so much the better. Give clean food and freshly drawn well water, and as a preventive give in the drinking water three times a day 10 drops Carbolic Acid for every 150 pounds live weight; or instead, 1 teaspoonful Hyposulphite of Soda for every 100 pounds live weight till danger

is past. Separate healthy, sick and suspects, and treat according to class, allowing no communication in any way between the lots. If one person attends all, he should attend the well ones first in every case. Buckets used for the sick should not be used for the well. Dogs may carry contagion from one pen to another. The lot in which the healthy hogs are placed should never be on ground capable of taking drainage from the others, and contamination by running streams must be scrupulously looked after in such times. Operations such as ringing, cutting ears and tails, spaying, castrating and the like should be delayed till epidemic is past, but if necessary, dress the wound daily with an effective disinfectant, as a solution of Carbolic Acid.—*From U. S. Bulletin.*

COMMON DISEASES OF SWINE

INFLAMMATION OF THE LUNGS; PNEUMONIA; LUNG FEVER.—

Symptoms.—Breathing is rapid and labored; there is shivering of body and limbs, more or less severe cough, no appetite, elevation of temperature.

TREATMENT.—

Put the animal in a quiet, comfortable and well-ventilated place, free from drafts. Put a preparation of Mustard and water on the chest and side and give the following:

Fluid Extract Aconite	16 drops.
Fluid Extract Belladonna	1 teaspoonful.
Saltpeter	2 drachms.
Alcohol	1½ ounces.
Water to make	½ pint.

Give one ounce of the solution four or five times a day.

Give nourishing food such as the hog will eat and keep it covered with a blanket, and this with good nursing will probably effect a cure.

QUINSY, OR INFLAMMATION OF THE TONSILS.—This is a common and often fatal disease if prompt relief is not given.

Symptoms.—Hog has difficulty in swallowing; there is slavering and the tongue sticks out; there is swelling and soreness under the lower jaw and neck.

TREATMENT.—

Apply to the swelling cloths wrung out in hot water, changing them frequently to reduce the inflammation. As soon as possible use the following:

Sulphate Magnesia	4 ounces.
Oil of Turpentine	2 drachms.
Soap Suds	½ pint.

Mix and inject into the rectum with a syringe.

If the animal eats give, mixed in a little gruel:

Turpentine	2 teaspoonfuls.
Lard Oil	4 tablespoonfuls.

If he does not eat, swab the tonsils often with the mixture by means of a swab fastened on a small rod. Following is also good:

Fluid Extract Belladonna	1 teaspoonful.
Chlorate of Potash	1 "
Camphor	1 "
Saltpeter	2 teaspoonfuls.

Mix into paste with molasses and flour and place ½ as a dose on back of tongue with a small paddle, three or four times a day.

SORE THROAT.—Common among pigs, but may occur at any age.

Causes.—Generally from catching cold, changing pens, or getting wet.

Symptoms.—There is sneezing and coughing; water will run through the nose when drinking; throat will be swollen and sore to press upon; much like quinsy only no external swelling. It is liable to extend through the litter from common cause

TREATMENT.—

Have good dry quarters, with ample bedding. Feed soft, warm food, with a large tablespoonful Sulphur for each six pigs, twice a day. When they will not eat, take 2 ounces each of Sulphur and Saltpeter, powder and mix, and throw a half teaspoonful back on the tongue three times a day. Rub stimulating liniment on the throat; a good one is:

Soap Liniment	4	ounces.
Aqua Ammonia	2	"
Turpentine	2	"

In severe cases use the hot cloths externally and the paste on the tongue as in Quinsy.

APOPLEXY, OR CONGESTION OF THE BRAIN (STAGGERS; BLIND STAGGERS).—

Cause.—Is usually filthy, ill-ventilated and poorly-drained quarters, with liberal feeding. Disease is most common among over-fat animals.

Symptoms.—Animal will be stupid; stands in a corner with ears lopped over; will not eat. As disease advances, becomes partly or wholly blind, going in a circle and striking against objects; the ears, nose and about the head becomes purple, and at last it falls unconscious. Sometimes there is an effusion on the brain, without other symptoms being especially marked; the animal falls suddenly, limbs stiffen, froths at the mouth, and breathing is hard, with a snorting sound. Comes on sometimes when commencing to eat.

TREATMENT.—

Give plenty of air; let cold water fall from a height on the head, or apply pounded ice in a cloth sack to the head. Prepare and give the injection as in "Quinsy" to move the bowels. Where not convenient to give injection, the following is recommended: For a pig 3 months old, 1 tablespoonful Epsom Salts; for one from 3 to 6 months old, 2 tablespoonfuls Epsom Salts, and for from 6 to 12 months old, 3 to 4 tablespoonfuls Epsom Salts; add according to age to Salts:

Sweet Spirits of Niter	1 to 2 tablespoonfuls.
Ginger	1 teaspoonful.

Dissolve in a half teacup of lukewarm water and pour down the pig after it becomes conscious.

Feed sparingly for a few days, give exercise and clean quarters, and give in feed the powder recommended for Indigestion.

COLDS.—

Symptoms.—Those commonly attendant on catching cold.

TREATMENT.—

Keep animal warm and quiet; feed well with food easy to digest; rub Vinegar and Mustard on the chest. Should disease not yield readily to treatment, give the solution recommended for Pneumonia.

SNUFFLES.—This is a common disease that usually gives way with warmth, good care and light, digestible food. Sometimes it assumes a chronic form, as nasal gleet. In such cases the animal had better be killed at once and buried. Give solution recommended for Pneumonia. Cause pig to inhale steam.

CHOKING.—This sometimes occurs by the animal trying to swallow something hard and too large for the throat.

Symptoms.—Animal coughs and saliva runs from its mouth. When it tries to eat or drink, the food or water will run back out of its mouth.

TREATMENT.—

Pour down a tablespoonful or two of melted lard with 10 drops Belladonna, and then if you can feel the obstruction in the neck passage, try and work it around so that it will go down. If in the back part of the mouth, open with a stick and remove obstruction with another stick or a pair of pincers. If these means do not succeed, use the probang as in cattle, pushing the obstruction down into the stomach. First tie a rope around the upper jaw and have the head held up; then place gag across the mouth, using as for cattle, but use a smaller probang.

ACUTE INDIGESTION.—

Causes.—Usually from a change of food. A pig that is poorly fed, gets into a field of peas or grain and overfeeds; or it may occur from too sudden a change in shutting up a pig to fatten.

Symptoms.—Animal refuses to eat; seems bloated; very uneasy and in pain. If from causes as enumerated, the trouble is pretty sure to be indigestion.

TREATMENT.—

For a six months old pig to a yearling, give the following:

Epsom Salts	3 tablespoonfuls
Hyposulphite of Soda	1 teaspoonful.
Ginger	1 tablespoonful.
Aromatic Spirits of Ammonia	1 "
Fluid Extract of Belladonna	10 drops.

Mix in a ½ pint of luke warm water and pour it down the pig. Give every three or four hours until animal is relieved.

Follow for a few days with powder recommended for Chronic Indigestion. In giving drench do not pour down too fast for fear of choking the animal. Death may result at any time from rupture of the stomach.

STUNTED, OR CHRONIC INDIGESTION.—A common trouble with pigs that have been put to solid food too soon after weaning; or poorly kept animals of any age. Is apt to follow preceding disease. May be also caused by worms.

Symptoms.—Good appetite, but no corresponding results in growth.

TREATMENT.—

If caused by worms, treat as under that heading. If the trouble be from feeding, change back to simpler and more liquid food, and let the change to heavy food be more gradual. Give with the soft food:

Gentian	½ pound.
Bicarbonate of Soda	½ "
Nux Vomica	¼ "
Arsenic	1 drachm.

Mix thoroughly. Dose: One tablespoonful to each 6 to 12 pigs, according to age.

Give in feed two or three times a day until they begin to thrive; also give twice a week a handful of hardwood ashes, charcoal and salt, in their feed.

CONSTIPATION.—This is liable to affect swine of any age, but more often those of the stunted class.

Causes.—In old hogs from having too much food, and being penned up too closely. In young pigs from indigestion and worms.

TREATMENT.—

For young pigs give the following:

Epsom Salts	2 teaspoonfuls.
Ginger	½ teaspoonful.
Bicarbonate of Soda	½ "

Dissolve in a ½ cup of lukewarm water; give every day until the bowels get in good condition.

For yearlings the amount can be doubled, and proportionately more for older and larger hogs. Modify amount and repetition according to condition. From 1 to 4 ounces of raw Linseed Oil or Castor Oil may also be given. In bad cases give the following:

Aromatic Spirits of Ammonia	1 teaspoonful to 1 tablespoonful.
Fluid Extract Nux Vomica	5 to 10 drops.
Water	½ teacupful.

Mix and give, repeating dose three times a day.

DIARRHEA.—

Causes.—Sudden change in kind of food; eating something frozen; excitement from being chased; or, in case of sucking pigs, from food or some disability in the sow.

Symptoms.—Watery discharges; no appetite, but great thirst.

TREATMENT.—

In the case of sucking pigs, *give the sow:*

Flour	1 teacupful.
Bicarbonate of Soda	1 teaspoonful.
Ginger	1 "
Laudanum	1 to 2 teaspoonfuls.
Lukewarm Water	1 quart.

Mix and give. Repeat three times a day.

Also give the pigs a few teaspoonfuls of the same three times a day. If this does not control, give each pig a little Blood Flour in a little water.

In ordinary cases—not sucking pigs—change food and give:

Flour	1 teacupful.
Bicarbonate of Soda	1 teaspoonful.
Ginger	2 teaspoonfuls.
Laudanum	1 teaspoonful.
Water	1 quart.

Mix and give as a drink three times a day.

Also give a teaspoonful of Blood Flour in a little water to each pig three times a day. Have a mixture of charcoal, hard-wood ashes and salt where the animals can get at it.

TURNING OUT OF THE RECTUM OR BACK BOWEL.—

Causes.—Generally caused in young swine by getting too much dry food. The bowels become costive, and while straining to pass manure the bowel is turned out. Or where pigs rise on their hind feet in the pen when fed; by being caught while trying to jump some low fence the same results follow.

Symptoms.—The back bowel bulges out in size from a half hen's egg to double or more that dimension.

TREATMENT.—

Syringe the protruding part with lukewarm water, with 1 ounce Alum or Copperas in each quart. Thoroughly clean, then oil the bulging part with:

Melted Lard	2 parts.
Laudanum	1 part.

And push it back to its normal place. If a small pig give it a drench of:

Epsom Salts	2 teaspoonfuls.
Lukewarm Water	½ teacupful.

And give:

Fluid Extract Nux Vomica	3 to 5 drops.
Castor Oil	1 to 3 ounces.

Three times a day for a few days.

Fasten the pig so that it cannot get up on its hind feet. Watch and oil and push back each time as soon as expelled. In case the bowel becomes blackened and will not remain in, let it

alone and the piece of dead bowel will drop off of its own accord, and the pig may be all right in a week or so, but keep the bowels moving freely as directed.

WORMS.—Mostly seen in young swine.

Symptoms.—The animal eats plenty but does not thrive well; sometimes small or very large worms may be seen in the manure that passes.

TREATMENT.—

Give a handful of charcoal and hardwood ashes in the food twice a week. Give twice a day to each 6 to 8 pigs; one teaspoonful of Copperas in their food. The following is also good:

Turpentine..... ½ teaspoonful.
Raw Linseed Oil..... 2 ounces.
Mix.

For Tapeworms, add to the oil and Turpentine:

Oil Male Fern..... 15 to 30 drops.
Areca Nut Powder..... 1 teaspoonful.

These are rarely present however.

FITS IN YOUNG PIGS FROM WORMS.—

Cause.—As stated in title.

Symptoms.—At first pig will probably be noticed as not thriving. After a time it has fits. The legs begin jerking, the head and neck bend back, and it champs its teeth, and after a time, falls over as if dead. In a short time it gets up and seems well for a time, and then another fit ensues, until finally if not relieved it dies.

TREATMENT.—

For a pig two months old, mix and pour down the following drench:

Turpentine..... ½ teaspoonful.
Raw Linseed Oil..... ½ teacupful.

Repeat once a day until bowels move and pig is relieved, after which feed once a day powder as recommended in treatment of "Stunted Pigs," and once a day Copperas as recommended for Worms.

MANGE, OR SCAB.—Is the product of a parasite (*Sarcopetes suis*) and should not be tolerated any more than the itch on mankind.

Symptoms.—Itching, with a scurvy condition of the skin

TREATMENT.—

Give at once and thereafter, once a day for two weeks, the following:

Sulphur	½ ounce.
Nitrate of Potash	1 drachm.

Mix and give as one dose in the food.

Wash the animals with same preparation as recommended for Scab in sheep; especially the Coal Tar products. Remove to clean quarters, with new bedding. Burn old bedding and whitewash with Quicklime, slaked with water in which Carbolic Acid has been added in the proportion of:

Carbolic Acid	3 parts.
Water	100 "

Paint the floor cracks and all surfaces outside and in. Do the job well.

LICE.—Swine that are infested with lice will not do well; and there should be no reason for their having them.

TREATMENT.—

Put 2 teaspoonfuls Creolin in a pint of water, and with this solution go over the pig carefully with a brush, rubbing it well over him. Make a second application in about one week, and the cure is usually complete. Clean pen thoroughly and sprinkle Lime on the floor. Give them new and clean bedding. Wash pigs with some of the Coal Tar products or with Kerosene Emulsion:

Kerosene Oil	1 gallon.
Soft Water	1 "
Hard Soap	½ pound.

Cut the Soap into shavings and dissolve in the water by boiling; remove from the stove and add the oil while the suds is hot, and churn with a force pump until a thickish white cream is formed; then add about 12 gallons more of soft water and thoroughly mix, and the Emulsion is ready for use. Apply warm.

FOUNDER, OR SORE FEET.—This is not an uncommon trouble in pigs that are fattening, when shut up in close quarters, with hard floors. Driving on hard roads, or giving a feed of wheat when not used to it, will also cause the trouble.

Symptoms.—The actions of the animal in trying to favor his front feet are obvious indications of this complaint; front feet kept out in front of him.

TREATMENT.—

If in summer, turn the affected animals out where they can have access to the soft ground. Pour water in the place where they lie every day, as the wet ground will be healing to the feet. Prepare the following:

Sulphur	½ pound.
Saltpeter	½ "

Mix and give 1 teaspoonful to each, twice a day in soft or liquid food.

In winter keep in dry, warm place, and keep bowels active with Epsom Salts, and give Saltpeter as above; feed light, sloppy food. In bad cases poultice the sore feet, and the animal will soon be well.

WOUNDS.—Wounds may arise from various sources—the bite of a dog, or of other hogs; from a barbed wire fence, from nails or from other causes.

TREATMENT.—

If serious, it may be best to sew it up, using needle and thread as directed in HORSE DEPARTMENT; put in stitches about ¾ of an inch apart; but first wash out with warm water and apply freely Carbolic Acid lotion:

Carbolic Acid	½ ounce.
Water	1 pint.

And dress each day afterward with the same solution by injecting it into the wound. If wound swells and looks red inject daily with:

Acetate of Lead	1 ounce.
Sulphate of Zinc	½ "
Carbolic Acid	½ "
Water	1 pint.

CASTRATION.—Pigs should be castrated at from two to three weeks old; never delay longer than the age of four weeks, since it requires about three weeks to recover from its effects before being weaned.

In this operation with all animals use the Carbolic Acid solution freely:

Carbolic Acid	½ ounce.
Water	1 pint.

Have a dish of it, into which the knife and anything else to be used during the operation are placed a few minutes before commencing to operate, and when the knife is not being used during the operation, place it back in the solution, and not down on some dirty board. Before making the incision into the scrotum, dash a little of the solution onto it and wash it off; and after finishing the operation, just before letting the animal up, dash a little of the solution into each wound. If there is any undue swelling after a day or two, separate the edges of the wound and syringe out freely with this solution. Repeat daily if necessary.

The operation with young pigs is very simple. Let an assistant hold the pig on its back, with its head and shoulders between his knees and the legs spread apart. With a sharp knife cut down into the scrotum, and onto the testicle; press it out from the scrotum and cut the thin attachment holding the testicle to front of scrotum, and with a jerk break the cord; or the cord may be cut with a dull pair of shears to prevent bleeding. Dash into the wounds a little of the Carbolic solution. If there is swelling the second day, inject with the Carbolic solution.

To castrate a boar, catch and turn him on his back and tie him securely. Place the right hand under the testicle and press it up to what is the top of the scrotum as the hog lies on his back; then take hold of the testicle with the left hand, and with a sharp knife in the right, make an incision in the scrotum large enough to allow the testicle to come out easily; commence the cut at the upper part so that there will be no pocket after hog is up. As soon as testicle is out, separate the covering from the testicle, where it is attached on the front side, by cutting the thin attachment. Pull the testicle and cord out three or four inches and tie

a strong cord tightly around the cord to prevent bleeding; leave the ends of the string four or five inches long so they will hang out of the cut. If catgut string is used ends need not be left long. As soon as the cord is tied, cut the testicle off half inch below where it is tied, and proceed in same manner with other.

In case of ruptured pigs or boars—which will be known by the enlarged scrotum, from the bowels coming out into it, and which can be recognized by the fact that on pressure they will go back to place, and immediately return when pressure is removed. Ruptured pigs should be castrated when young. If an old boar, starve him for twenty-four hours to empty the bowels, and they will go back to place easier. Have help enough to hold the hind end of the pig well up while you press the bowels back, and they will stay there while operating. Proceed as in other cases, except in making the incision be careful and do not cut through the last covering next to the testicle, but separate this from the outer covering and press it out along with the testicle; draw them down two or three inches and tie the string tightly around the cord and covering, and then cut off both testicle and covering one inch below the string. As a safeguard against the bowel coming out, in case the string slips off, the incision in the scrotum can be sewed up. After a couple of days, if the bowels do not come down, cut out the stitches and syringe out the wound with the Carbolic Acid solution. If ruptured on one side only, remove the other testicle first. If a small pig, let him run with others; if a large one, keep him in a quiet place, and feed him very lightly for a few days.

PARALYSIS.—Sometimes a pig will become paralysed in its rear limbs, being unable to use these members.

Causes.—Sometimes obscure, at other times perhaps due to a blow or other injury to the back.

Symptoms.—The animal has lost all use of the rear limbs, and when it moves drags the rear parts. These parts have also lost their feeling to a very great extent. In other respects animal may appear quite normal.

TREATMENT.—

Rather unsatisfactory; feed on laxative food and give three times a day in the feed 5 to 10 drops of Fluid Extract of Nux Vomica. Apply to the loins once a day with liberal rubbing a good liniment, as:

Strong Aqua Ammonia	2 ounces.
Turpentine	2 "
Raw Linseed Oil	4 "

RHEUMATISM.—Pigs sometimes seem to be affected with this trouble. While the exact cause is not known, animals kept in dark, damp quarters without opportunity for exercise are most subject to disorder.

Symptoms.—These vary somewhat; the animal may be dull, partially off feed, and when it moves does so as if sore and stiff all over; in a more severe case, animal may refuse to get up, and cries with pain when forced to move; limbs may be swelled.

TREATMENT.—

Place in a warm, dry place, well littered, and feed sloppy food. For medium sized animal give 3 ounces of Epsom Salts. Also the following:

Sweet Spirits of Niter	1½ ounces.
Fluid Extract Colchicum Seed	½ drachm.
Fluid Extract Belladonna	1 "
Water	8 ounces.

Dose: 1 ounce four times a day.

Also give ¼ drachm of Salicylic Acid in a little milk three or four times a day. Keep covered with woolen blankets. Bottles of hot water placed around the animal under the blanket would be good.

BLACK TEETH IN YOUNG PIGS.—These are small, black teeth that are found in the mouth of young, new born pigs, and which continue to grow for some time after; but after a time they may drop out of their own accord. Sometimes, however, they grow in such a manner as to cut the tongue or cheek, and unless attended to cause the pig considerable annoyance.

TREATMENT.—

When a pig is not thriving, examine his mouth to see that he is not suffering from laceration caused by such teeth, and if so, pull at once. If no laceration look elsewhere for cause of unthriftiness.

FRACTURE OF A LEG.—

Causes.—May be from various sources. A kick; getting the foot through a hole in the floor; being struck with a stone, and the like.

TREATMENT.—

If it is a fat animal and about ready to kill, butcher it at once. If a valuable animal and one you wish to keep, and the bones do not come through the skin, it may be worth the trial of saving. Take a long bandage of cotton, soak it in a thick starch, as for starching clothes, draw it between the fingers, and scrape with a knife to get out a portion of the starch so it will dry quicker, then roll it up so it will be in shape to handle. Set the broken bone in place and wind the bandage on moderately tight. After it is on keep the leg and bandage straight until the bandage hardens. Keep the animal quiet, feeding it so it will not have to stir around. In three or four weeks, when the leg is healed, remove bandage by cutting it off. If break is in hip or where it cannot be set and bandaged, leave pig in quiet place, and sometimes the broken bone will knit together. Read article in HORSE DEPARTMENT for fuller details.

FARROWING, OR PIGGING.—The average time of gestation for sows is three months, three weeks and three days. There is, however, a variation of from twenty to thirty days. Young and weak sows carry their young a shorter time than older and stronger ones. In about a month and a half the sow begins to get large, and continues doing so until farrowing time. When the time comes, see that there is abundant short material for a bed, and in good warm quarters if in winter. Nothing is more susceptible to cold than a newly born pig. A temperature of not lower than 65 is necessary until properly dried off and the

teat is taken; then a temperature of not under 50—60 would be better—is necessary for their doing well. Just before the time approaches, the sow becomes uneasy and starts to make her bed. If disturbed she makes a fuss and seems excited. When the bed is made she seems sick and lies down; the labor pains come on; she will strain and the water bag will appear and break. If all is right she will soon be delivered of one; the front feet and head should come first, but sometimes the hind feet come first. In a few minutes she will strain again and another will soon be delivered, and so on until the litter is complete. After this there is usually no trouble, unless there is too much bedding and she smothers or lies on the pigs. Sometimes in farrowing a pig will come crooked and get lodged in the passage, in which case the sow must be assisted. The pig may be coming head first with the front feet turned back, or coming breech first with the legs turned in under it, and in examination all you can feel is the tail and rump. If the sow is large enough, oil with Carbolized Lard and pass your hand into the passage; if the front legs are turned back, shove it back into the womb; catch the legs with your finger and bring them up even with the head, then pull legs and it will come right. If coming backward and the hind legs are turned under, shove the pig back into the womb and straighten out the legs so that the hind feet will come first. In doing this kind of work always have the hand well oiled and try and not bruise the passage, for it will swell and make the work still more difficult. If the pig is crowded well back in the passageway with the front feet bent back, it may be possible to extract it without correcting the position by catching hold of the head with a pair of pig forceps, or by slipping a looped string into the mouth and slipping it down tight onto one of the jaws, or by crowding the looped end beyond the head and twisting down tight. A hooked wire may be used to advantage at times, especially if the pig is dead. A pig should not be allowed to block the passageway for any great length of time, as those unborn are apt to die if the straining is kept up. Gentleness is required in all this work, and everything used should be clean and well oiled. Read discussion of subject in HORSE and CATTLE DEPARTMENTS.

FEVER IN SOWS.— This disease is occasionally met with in sows, from varying causes.

Symptoms.—When the pigs are farrowed and go to the teat they can get no milk, and on examination it will be found that the teats are soft instead of being full and hard, showing that no milk is being secreted. The sow seems sick and is feverish; takes but little or no notice of the little ones; will not eat, but is very thirsty and will drink a great deal if where she can get it.

TREATMENT.—

To a good sized sow give 4 ounces of Epsom Salts. Also give:

Sweet Spirits of Niter.....½ ounce.
Fluid Extract of Belladonna..... 5 to 10 drops.
Fluid Extract of Nux Vomica..... ..10 "
Water..... 4 ounces.
Repeat four times a day.

Give soft feed, bathe milk glands three times a day with hot water, rubbing dry after each bathing and rubbing freely with:

Spirits of Camphor..... 3 parts.
Turpentine..... 1 part.

Wipe off any excess of liniment so it will not irritate the pig's mouth. Keep the pigs sucking to encourage a flow of milk. Feed the pigs milk from a new milch cow, reducing the milk one-third with water and sweetening it with sugar. Feed with a spoon or let them suck from a bottle. By keeping up treatment, not forgetting to keep pigs at the teat as much as possible for a few days, the sow will probably come round to normal condition.

INFLAMMATION OF THE MILK GLANDS IN A SOW.—

Causes.—Catching cold; losing part of the litter, and not having enough pigs to keep the milk glands properly drained out, for which reason they get so full of milk as to swell, become sore and inflamed.

Symptoms.—Sow is dull, feverish, may refuse to eat; when pigs suck it causes pain, and they do not get much milk; milk glands are found on examination to be swollen, hard and tender to touch.

TREATMENT.—

Give the sow 4 ounces of Epsom Salts. Also give the following:

Saltpeter	3 drachms.
Fluid Extract Belladonna	1 drachm.
Water	8 ounces.

Dose: 1 ounce of the solution three times a day.

Bathe the glands for an hour three times a day with hot water, rub dry after each bathing and apply with liberal rubbing Camphorated Oil, or:

Spirits Camphor	3 ounces.
Witch Hazel	3 "
Turpentine	1 ounce.
Fluid Extract Belladonna	1 "

Shake.

If any abscesses form open and wash out with a Carbolic Acid solution. In severe cases wean the pigs.

EVERSION OF THE WOMB, OR PIG BED TURNED OUT.—This is sometimes a result of farrowing where the sow lies in a place where her hind quarters are lower than the front; the womb works back in the passage, causing her pain; she strains and forces the womb inside out.

Symptoms.—Are obvious. The womb, or pig bed, which is turned out behind, is larger than a man's head, and in a short time becomes very red and swollen.

TREATMENT.—

As soon as seen, bathe the womb by pouring cold water over it to reduce swelling, and cleanse it. Apply the water for fifteen to thirty minutes, and then pour over it a little Carbolic Acid solution—Carbolic Acid, 2 teaspoonfuls; water, 1 pint. Have a couple of men raise the sow's hind parts straight up while you return the womb, beginning at the passage. Keep turning in until all is in the passage. Now oil hand and wrist with Carbolized Lard—Carbolic Acid, 1 teaspoonful; Melted Lard, 4 ounces—and pass hand into passage, pushing the womb back into place.

As soon as done, sew up the vulva, or entrance to passage, putting two or three deep stitches across it, just leaving opening enough at the bottom for sow to urinate. Leave stitches in from two to four days until she stops straining, then cut and pul them out. If she keeps straining after womb is replaced, give as a drench:

Laudanum	¼ ounce.
Fluid Extract Belladonna	10 drops.

In a little water.

Repeat in two hours if not relieved, and continue to do so once in three or four hours until straining stops, and apply to the loins large cloths wrung out from hot water. Give the sow 3 ounces Epsom Salts and feed lightly upon sloppy food for four or five days. Also give the following:

Sweet Spirits of Niter	2 ounces.
Fluid Extract Belladonna	1 drachm.
Fluid Extract Aconite	15 drops.
Water	8 ounces.

Dose: 1 ounce three times a day.

INFLAMMATION OF THE WOMB.—This is an inflamed condition of the womb which sometimes follows farrowing; it is apt to result where the womb has been everted; it also results from rough and careless assistance at farrowing, or from farrowing in a filthy, damp place; and again it occurs when there seems to have been no cause.

Symptoms.—It comes on from one to five or six days after farrowing; at first animal may appear to be doing nicely, but later shows dullness, refuses feed, desires to lie down, gives little or no milk, apt to show great thirst, may evince pain when flank is pressed against, vulva is apt to be swelled with a discharge from it; the animal has a fever, the temperature being from four to six degrees above normal (normal temperature of pig about 102 degrees).

TREATMENT.—

Give the same treatment as recommended for the after-treatment in throwing out of the womb, giving about five times a day instead of three. The Laudanum and Belladonna given for

the straining may of course be omitted. Apply blankets wrung from hot water to the loins, changing frequently. Also well to flush out the womb twice a day with the following:

Warm Water (temperature 115°)...	1 quart.
Carbolic Acid.....	1½ teaspoonfuls.
Alum.....	½ ounce.

To use take a piece of rubber tubing with funnel in one end, oil the other end, insert gently into the vulva, elevate the funnel and pour the solution into it. Watch for a little time to see that any straining which may follow does not throw out the womb. Give but little sloppy food if sow desires to eat; feed pigs as in "Farrowing Fever."

THUMPS.—This is a disease which attacks small pigs generally before weaning.

Causes.—The disease is a result of a spasmodic contraction of the diaphragm, the exact cause of which is unknown. Seen most often in overfat pigs, which do not have sufficient exercise. Before the disease attacks them they are beautiful looking little fellows.

Symptoms.—The animal is affected with a sort of hiccough, which is more or less continuous; this causes a jerking of the body, a sort of thumping, and hence the name. May also get a heavy beating of the heart. The little fellow refuses to eat, is much depressed and unless relieved will die.

TREATMENT.—

Prevention is better than cure; with heavy, milking sows, where the pigs are apt to become unduly fat, see to it that both mother and pigs take a good amount of exercise; also keep the bowels of mother active by use of laxative food. To pigs which are affected with the disease, give from a teaspoonful to a tablespoonful of Epsom Salts, and 1 to 3 tablespoonfuls of Castor Oil. Also give the following:

Aromatic Spirits of Ammonia...	2 teaspoonfuls.
Tincture Digitalis.....	½ teaspoonful.
Laudanum.....	1 "
Tincture Belladonna.....	1 "
Water.....	4 ounces.

Dose: Teaspoonful to small pig before weaning; repeat every two to four hours.

If one pig of the litter shows trouble, give the remainder a laxative and more exercise; and also give the mother 4 ounces of Epsom Salts.

HOW TO RING A PIG.—There are many who do not believe in the practice of ringing swine, except for stock that is being fattened, or fed in the fields with that end in view, since it prevents hogs from getting food in the natural way—by rooting. Make a noose on the end of a small rope, slip it into the animal's mouth and draw it tight over the upper jaw, and have the rope over a beam to draw the head up tight; have pincers and ring ready, and while the hog pulls back, close the ring on its nose so as to catch not over ¼ of an inch on the gristle; this is done by pressing on and closing pincers over the ring. See that rings are not rusty, and put in from one to three rings, according to age and size.

Note.—Swine are subject to many other disorders, the same as other animals, and need the same treatment for these disorders as described in the other departments, dosing according to size.

POULTRY

DISEASES AND THEIR TREATMENT

APOPLEXY.—

Causes.—The cause of this disease is over-feeding and confinement in close quarters; with hens, perhaps the straining in laying the egg.

Symptoms.—In mild cases the fowl may be moping for several days, but usually the trouble is not noticed until it falls and dies with hardly a struggle.

TREATMENT.—

There is generally no opportunity for treatment; in a mild case the same treatment as for vertigo would be indicated. The prevention lies in plenty of exercise and abstinence from over-stimulating food and well ventilated quarters.

VERTIGO; CONGESTION OF THE BRAIN.—

Causes.—Usually caused by strong feeding and lack of room for exercise; worms in the digestive tract; exposure to hot sun.

Symptoms.—The fowl runs in a circle with but little control of its legs, or runs backward with head thrown up, and in some cases falls; has convulsive movements and may die.

TREATMENT.—

As soon as noticed hold the head of the fowl under a stream of cold water, which will soon give relief. About 10 grains Jalap may be given after the water treatment, or a laxative in the form of about ½ drachm of Epsom Salts or a tablespoonful of Castor Oil. If due to worms, treat to remove these. Keep on a low diet and in a cool place.

CATARRH, OR COLD.—

Causes.—The causes are damp poultry houses, and roosting in exposed situations or in drafts.

POULTRY YARD.

Symptoms.—In simple catarrh or cold there will be swelling of the eyelids, a watery or other discharge from the nostrils, and the face may be more or less swollen at the sides. In very bad cases the breathing may be interfered with and the fowls appear dull.

TREATMENT.—

Remove to dry and better quarters. Give warm food liberally dusted with pepper. In bad cases, wash mouth, nostrils and eyes with an astringent wash, as:

Alum, or Boracic Acid.....½ ounce.
Water ..... 1 pint.

Let the bird inhale steam from water into which has been put a little Camphor and ½ teaspoonful Fluid Extract Belladonna.

BRONCHITIS (Sometimes Called Croup).—

Causes.—Results when the effects of a cold extend into the air passages of the lungs.

Symptoms.—There will be a cough, raising of the head to breathe, a more or less offensive smell, dullness, and upon listening to the breathing, a blowing or wheezing sound may be heard at the base of the neck.

TREATMENT.—

Place in fairly warm, clean, light, well-ventilated quarters. In severe cases mix and give:

Calomel..... 1 grain.
Tartar Emetic.....⅛ "

Let the fowls drink the following solution:

Chlorate of Potassium.....¼ ounce.
Soft Water ..... 2 quarts.

Steam the head as in Catarrh. Some recommend 10 drops of Turpentine in a teaspoonful of Castor Oil twice a day. As a prevention have proper care, cleanliness and good ventilation.

ROUP—CONTAGIOUS CATARRH.—

Causes.—Roup is a highly contagious disease, and one of the principal ones that afflict poultry. While neglected colds, or cold,

damp conditions may predispose to it, the real cause is a micro-organism—hence its contagious nature.

Symptoms.—Are at first like those of Catarrh of a severe type; but it terminates in a thick, opaque and offensive discharge from the nostrils. Froth appears at the inner corners of the eyes; the lids swell and often eyes are entirely closed; sides of the face are swollen, and bird rapidly loses strength, presents a very dejected appearance, and if not relieved soon dies.

TREATMENT.—

The first thing to do is to separate all affected fowls from the well ones. The separation must be complete, otherwise all will contract the disease. Remove the healthy to new quarters, as the quarters of the sick are infested with micro-organisms of the disease. The sick may be left where they are if quarters are desirable.

With common fowls it may be as well to kill and burn as soon as the true nature of the disease is determined, as time required for treatment makes it expensive.

Have dry, warm quarters, free from drafts, and give soft and stimulating food. Give as soon as possible, for a small fowl, 1 teaspoonful, or for a large fowl, 1 tablespoonful, Castor Oil. Syringe out the nostrils with a small syringe inserted in the slit of the roof of the mouth; also the eyes with:

Boracic Acid..... .....½ ounce.
Carbolic Acid..... 1 teaspoonful.
Water..... 1 pint.

Three or four hours after giving oil, give the following:

Balsam Copabia.....½ ounce.
Licorice Powder.....¼ "
Piperine .....½ drachm.

Mix and make into 30 doses, and give 1 two or three times a day. Steam head as in Catarrh.

If affected fowls continue to grow worse, kill and burn them. Kerosene Oil is also recommended, injected into the nostrils, as is Camphorated Sweet Oil; and also Sulphate of Copper, 1 to

2 teaspoonfuls to a pint of water. All dishes used should be disinfected with a solution of Carbolic Acid or some equally good disinfecting fluid. The house where the sick fowls have been kept must also be thoroughly disinfected and not used for other poultry for a time. (See "Disinfection" under HOG DEPARTMENT.)

DIPHTHERIA.—This disease by some is considered the same as Roup or Contagious Catarrh; by others it is considered to be a different disease. It is a contagious disease and is introduced and spread the same as other contagious disorders.

Symptoms.—The symptoms are very similar to those of Roup, about the only difference being that in this disease there form on the tongue, in the mouth, throat, and perhaps in the windpipe, what are called false membranes, a grayish or yellow colored layer. If removed the tissues underneath are left raw and bleeding. For other symptoms see "Roup."

TREATMENT.—

The treatment is about the same as Roup, especially the washing of the affected parts with Carbolic Acid, 2 teaspoonfuls; Water, 1 pint. Paint the false membranes with Tincture of Iodine. Glycerine is also good to apply to them.

As some cases are recorded where children seem to have contracted this disease from poultry, keep them away from the affected fowls. It is not, however, the same as the ordinary diphtheria affecting people.

DIARRHEA.—

Causes.—Inadequate shelter; cold, wet weather; filth, or from reaction after constipation caused by too little green food; also accompanies various diseases.

Symptoms.—Are obvious.

TREATMENT.—

Remove the cause as far as possible, and feed on warm barley meal liberally sprinkled with powdered chalk; and give four times a day:

Spirits of Camphor	3 drops.
Laudanum	5 "
Tincture Catechu	5 "

In a pill of meal, or a little water. It is sometimes well to give a teaspoonful of Castor Oil at first. Give from 1 to 2 teaspoonfuls Copperas in each pint of drinking water. One drachm Subnitrate of Bismuth in a little Linseed Meal gruel, divided into 30 doses, is oftentimes valuable.

CHICKEN CHOLERA.—

Causes.—A contagious disease caused by a micro-organism, predisposed by overcrowded, dirty quarters, unwholesome food and the like.

Symptoms.—Fowl has a sleepy, droopy look; the feathers roughen, wings droop, head drawn toward the body, giving the fowl a ball-shaped form; is very thirsty and has slow gait; sometimes staggering and falls from weakness. Comb and wattles lose their normal color, generally turning pale, though sometimes dark. The crop fills with gas and mucus, and at the last food is not digested. There is diarrhea with greenish, or sulphur-like discharge; passages frequent; breathing heavy and fast, eyes close, and after a few hours the fowl dies.

TREATMENT.—

First separate healthy from diseased and renovate the coops thoroughly; saturating the roosts, floor and sides with a solution of:

Carbolic Acid..	½ ounce.
Water	1 pint.

While different remedies have been recommended from time to time in the treatment of this disease, it is doubtful if any of them has much value. Isolation and careful disinfection will have to be relied on to check the spread of the disease. It is often best to kill and burn the first affected. All the droppings about the yard having the characteristic color of the disease should be gathered and burned and the ground wet with the Carbolic Acid solution. The following solution is sometimes used:

Carbolic Acid	1 teaspoonful.
Water	1 quart.

Give 1 teaspoonful of the solution three times a day.

A solution of Hyposulphite of Soda is also used; a teaspoonful three or four times a day of the solution made by dissolving 1 to 2 ounces in a quart of water. One teaspoonful of Copperas dissolved in ½ pint water, and a teaspoonful of the solution given twice a day, may be of value.

As a preventive with the unaffected, keep them strong and vigorous by the use of good feed and the following tonic·

Gentian	2 ounces.
Cooking Soda	2 "
Nux Vomica	1 ounce.
Charcoal	2 ounces.

Give a tablespoonful in the feed twice a day for each 40 to 60 fowls.

Thorough and continuous disinfection, and the isolation of the sick as soon as they show symptoms of sickness, must be the principal reliance in fighting this disease.

PIP.—It is not a disease, but rather the result of one. A scale or crust forms on the tip of the tongue, as the result of inflammation of the mouth from various causes, perhaps breathing through the mouth when nostrils are closed.

TREATMENT.—

Do not tear the scale off, but rather soften it and thus hasten its coming off. If result of breathing through the mouth, remove this cause. Moisten the tongue with a mixture of equal parts of Glycerine and Witch Hazel. Syringe out mouth with the following:

Chlorate of Potash	½ ounce.
Water	1 pint.

Or with Boracic Acid same strength. Give teaspoonful Castor Oil and feed on soft food.

GAPES.—

Causes.—The cause is a parasitic worm, and occurs usually in chickens from two to four months of age. The worms are found in the windpipe attached to its lining. The female is about one-half inch in length; the male only about one-half this length; they are frequently attached to each other.

Symptoms.—The affected birds are seen to gape frequently, hence the name. In bad cases, become weak, wings droop, cough, and if one of the affected is destroyed and windpipe opened and examined, the worms may be seen.

TREATMENT.—

To cure the gapes strip a stiff feather almost to the tip, dip this in Spirits of Turpentine, and insert it into the opening to the windpipe at the base of the tongue; turn it around once or twice and withdraw; be gentle in this or it may kill the chick. Insert feather when entrance to windpipe opens in breathing. Give warm, dry shelter, good, soft food well mixed with black pepper, with skim milk to drink. A bit of Camphor the size of a grain of wheat, daily, is recommended; also 5 grain doses of Asafetida.

In the case of very young chicks, who suffer most, the only remedial treatment that seems to be successful is rubbing the neck from time to time with Lard or Vaseline, thoroughly mixed with a little Turpentine (3 parts of the Lard or Vaseline to 1 part of Turpentine). This treatment should begin before the disease makes its appearance. It will not help a chick in the last stages of the disease. Pure Turpentine will very quickly kill a chick when rubbed on the neck over the trachea.

All the healthy should be separated at once from the diseased and put where the diseased have not been. Thoroughly disinfect the houses, runs and coops of those affected (see under "Roup") to destroy worms or eggs which may be in these places. The birds become affected by taking the worms or eggs with their food.

CROP-BOUND.—

Causes.—Usually irregular feeding. The hungry bird stuffs his crop to such a degree that the whole when moistened becomes a hard, compact mass. Sometimes a bone will serve as a nucleus for other material to gather round.

Symptoms.—The bird is dull, refuses feed, appears drowsy, and the crop is enlarged and hard.

TREATMENT.—

Give a little Castor Oil, 1 teaspoonful. After giving the Oil work the end of the crop nearest the throat and try and break up the mass and work it back out of the mouth; hold the head down as it is worked out. By a little patience and the occasional use of Oil the mass can generally be removed; afterward feed lightly on soft feed for a few days.

CANKER.—

Causes.—Unsanitary quarters and musty or unwholesome food.

Symptoms.—Running sores on the head and in the mouth or throat, accompanied with a watery discharge from the eyes.

TREATMENT.—

Wash head and swab out the mouth and throat with:

Boracic Acid	½ ounce.
Water	1 pint.

Swab ulcers with:

Carbolic Acid	½ ounce.
Water	1 pint.

And then apply a little burnt Alum. Feed on soft food.

RHEUMATISM.—

Causes.—Damp, unwholesome premises, and from chickens running about in the dew or wet in early season. Cramp is produced by the same causes.

Symptoms.—Most apt to affect feet or joint above, swell and and become painful; bird is lame, dislikes to stand and may refuse to walk.

TREATMENT.—

Prevention is very important. Good, clean, dry quarters, with plenty of nutritious food, varied as much as possible, is necessary in the treatment. The affected bird may also be given a

laxative: Epsom Salts, ½ teaspoonful. Also give three times a day a solution of:

Salicylic Acid..... 1 drachm.
Water..... 3 ounces.
Dose: 1 teaspoonful.

Apply Spirits Camphor and Laudanum, equal parts, to the swellings.

INFLAMMATION OF THE EGG PASSAGE.—The disease is rare, but sometimes occurs.

Symptoms.—If the inflammation is at the lower end of the passage, the egg is without shell; if at the middle portion, the membrane is misshapen or incomplete; if the whole passage is inflamed, the yolk is passed out without any covering; also get misshapened eggs and eggs without yolk, or eggs with more or less blood. The laying of soft shelled eggs is not an evidence of inflammation; it may be from being driven about, or from lack of lime material. In inflammation there will be fever, and the feathers, over the back especially, will be ruffled, the hen moping and at times trying to discharge contents of the passage.

TREATMENT.—

The following is good:

Calomel..... 1 grain.
Tartar Emetic.....1½ "
Give in a little Gelatine.

Or: Epsom Salts, ½ teaspoonful; give in a little water. Keep the hen on nourishing but not stimulating food, and give 1 teaspoonful of the following three times a day:

Cooking Soda..... 1 teaspoonful.
Tincture of Aconite.....10 drops.
Tincture of Belladonna.....20 "
Water..... 3 ounces.

If the fowl is not a valuable one, the best thing is to kill it.

LICE.— There are two varieties, one the common hen louse and the "hen spider," the latter being almost microscopic.

TREATMENT.—

For the first, Scotch Snuff or the Flowers of Sulphur is said to be efficacious, using it to sprinkle both the breeders and nests. The little lice are best exterminated by fumigation and insecticides. A good plan is to drive the fowls from the hen house, and close it tight, then put a pound or more of Sulphur in a pot, and set it on fire with coals, and keep it burning for several hours. Be careful about inhaling the fumes. Then open doors and clean the place thoroughly, for no half way measures will count. Put in plenty of hardwood ashes and coal dust for the hens to roll in. Cover the floor and roosts and sprinkle into all cracks road dust. This will kill the lice. After about a week repeat the fumigation and the ashes and coal dust. Whitewash everything in the hen house, and change the straw in the nests. If your building cannot be closed tight enough to fumigate, then clean and scrub every part of the building, and cover every surface and fill every crack with whitewash, to which a little Carbolic Acid, 3 ounces to a gallon, has been added. Wash the perches, nests, etc., with a solution made by adding 1 pound of Potash to a quart of water; or spray house thoroughly with Kerosene Oil. Make an application of Flowers of Sulphur or Pyrethrum Powder to the fowls themselves. The fowls themselves may be dipped in:

Creolin	2½ ounces.
Water	1 gallon.

Or some of the Coal-Tar products may be used for dipping, as Zenoleum or Kreso. In case of small chicks grease with pure lard.

WORMS.—Poultry, like other animals, are apt to be affected with worms in the intestines, both the round worms and tapeworms; especially is this true where they are kept upon the same, and rather small, runs year after year.

Symptoms.—There is nothing very characteristic about the symptoms; the birds appear dull, are poor, may have diarrhea; but upon opening the intestines of one which had died or been killed, the worm will be found.

TREATMENT.—

For the round worms Turpentine is good, 10 to 15 drops in a teaspoonful of Castor Oil. Sulphate of Iron given in the feed is good, ½ teaspoonful for 60 birds. Santonin, 1 drachm to each 20 fowls, is also good. For tapeworms:

Areca Nut..... 20 grains.
Oil Male Fern..... 5 to 10 drops.
Turpentine..... 10 "
Castor Oil..... 1 teaspoonful.

Give after keeping bird away from food eighteen hours.

LEG WEAKNESS.—

Causes.—A disease of young fowls, and more generally of young males. It sometimes arises from inbreeding, or breeding the same strain of fowls too long. The larger breeds are most subject to it; also improper feeding and too close confinement.

Symptoms.—The bird is unable to stand, and walks, if at all, with great difficulty. Upon examination, legs are found to be free from swellings or soreness.

TREATMENT.—

The remedy is a nourishing diet, with a due proportion of insect or animal food. From 3 to 8 grains of Citrate of Iron may be given daily as a tonic. A mixture composed of:

Sulphate of Iron..... 2 ounces.
Phosphate of Lime..... 2 "

May be used as a tonic. Give an amount as large as two peas on the tongue twice a day, or mix in the feed. Give an opportunity for exercise.

SCALY LEGS.—

Causes.—A contagious disease which is caused by a small parasite that burrows under the skin.

TREATMENT.—

The most effective remedy is to dip the fowl's legs up to the feathers in Kerosene Oil. This is said by authority to be very effective and not harsh. Or, clean the houses thoroughly and

especially use Kerosene freely on the roosts, and also paint the legs of the fowl with Kerosene Oil three times a week until the scales drop off; then scrub the legs with soap and water and rub every other day with Vaseline. This will cure the trouble if it is not too bad.

The diseased should be separated from the healthy and the house thoroughly treated, as recommended with "Lice."

Before applying treatment soak the legs in warm water and remove all loose scales.

Dip or soak legs in Creolin Solution, as recommended in treatment for "Lice."

BLACK HEAD; CONTAGIOUS INFLAMMATION OF INTESTINE AND LIVER.—This is a disease which has been reported from various parts of the country for the past twelve to fifteen years. It is especially prevalent in New England. The disease affects turkeys. It is caused by a micro-organism belonging to a class known as the Protozoa. These parasites are taken along with the food or drink, and upon reaching the caeca, the two blind portions of the intestinal tract, they multiply, set up inflammation, enlarging these organs and thickening their walls. They also pass to the liver and produce in this organ discolored spots of a grayish or a yellowish color; the liver is also very much enlarged.

Symptoms.—The disease generally runs a slow course, and at first the symptoms are hardly noticeable; a little dullness, hanging behind the flock or not going with them, and sooner or later diarrhea and unthriftiness. Very often the comb, wattles and perhaps the skin about the head becomes black or dark colored; hence the common name. The post mortem shows the internal symptoms already given. Young fowls are more apt to contract the disease, but it often runs a lingering course, so that death may not occur until fall. On the other hand, they may die in a few weeks.

TREATMENT.—

Medicinal treatment is entirely unsatisfactory, except, perhaps, keeping the turkeys vigorous by the use of the tonics as

recommended for "Chicken Cholera." The Copperas or Hyposulphite of Soda may also be added to the drinking water.

The disease having once made its appearance, all the flock which survive should be killed and the raising of turkeys discontinued for a year or two at least. All runs and houses thoroughly disinfected, and when the raising of turkeys is again tried, start by getting eggs, and keep the birds out of the old houses and off the old runs if possible.

POULTRY HOUSES

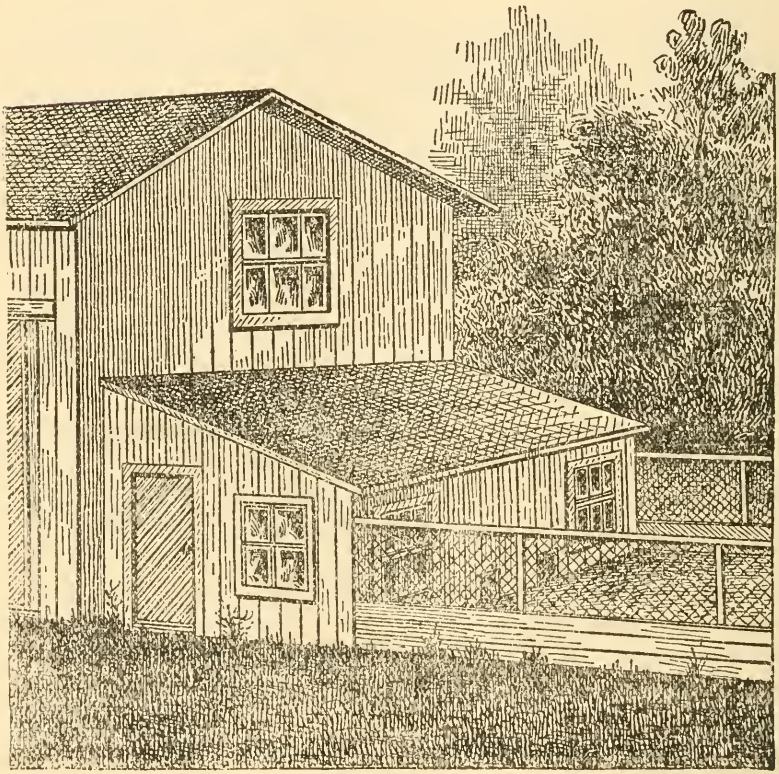


Fig. 1—A Lean-to Poultry House

POULTRY HOUSES.—It is very desirable that poultry should be provided with a house somewhat separated from the other farm buildings, but near enough to the barnyard so that they can spend a part of their time in scratching for, and gathering up, the many seeds and grains which otherwise would not be utilized. On farms where no poultry house is provided the hens are compelled to seek roosting places wherever they can find them—sometimes in fruit trees, sometimes on feed racks,

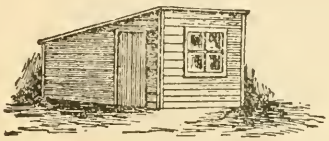


Fig. 2—Simple Form of Poultry House

Fig. 3—Ground Plan of Simple Form of Poultry House

sometimes on the farm machinery, or even the wagons and carriages. The result is not only untidiness, but fruit, feed, implements and wagons are soiled and injured by the droppings, and sometimes vermin swarm in the roosting places to such a degree that the hens are voted a nuisance rather than a desirable part of a farm stock. If these vermin-infested places are near the

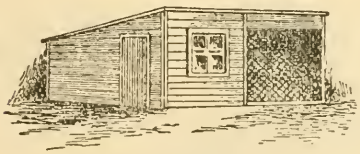


Fig. 4—Poultry House with Scratching Shed

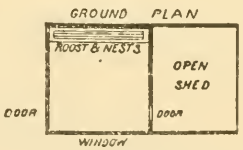


Fig. 5—Ground Plan of Poultry House with Scratching Shed

horse stable, the mites may attack the horses, causing itching and a mangy condition of the skin, the origin of which is not always suspected.

PREFERABLE CONDITIONS.—Poultry houses need not be elaborate in their fixings nor expensive in construction.

There are certain conditions, however, which should be insisted upon in all cases. In the first place, the house should be located upon soil which is well drained and dry. A gravelly knoll is best, but failing this, the site should be raised by the use of the plow or scraper until there is a gentle slope in all directions sufficient to prevent any standing water even at the wettest times.

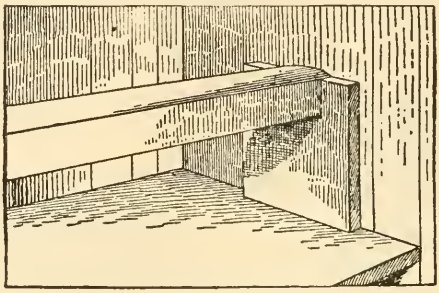


Fig. 6—Construction of Roosts

A few inches of sand or gravel on the surface will be very useful in preventing the formation of mud. If the house is sheltered from the north and northwest winds by a group of evergreens, this will be a decided advantage in the colder parts of the country.

UNUSED BUILDINGS.—Sometimes there is already on the farm a small building which has been used for implements or

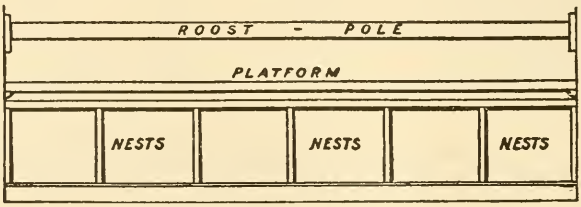


Fig. 7—Sectional View of Platform and Nests

animals, and which is no longer needed for those purposes. Such a building may be easily fitted for poultry by cutting a small door in one side and placing roosts and nests in the interior.

INEXPENSIVE STRUCTURES.—In case there is no building suitable for remodeling into a poultry house, an inexpensive lean-to may be built (Fig. 1), or a new building

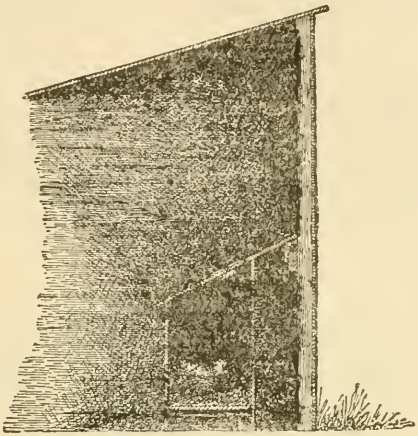


Fig. 8—Sectional View of Concealed or Darkened Nest

constructed. A house for this purpose should be planned with a view to simplicity, economy and convenience, while supplying the conditions proper for successful poultry keeping. One of the simplest forms of poultry house is shown in Fig. 2, and the ground

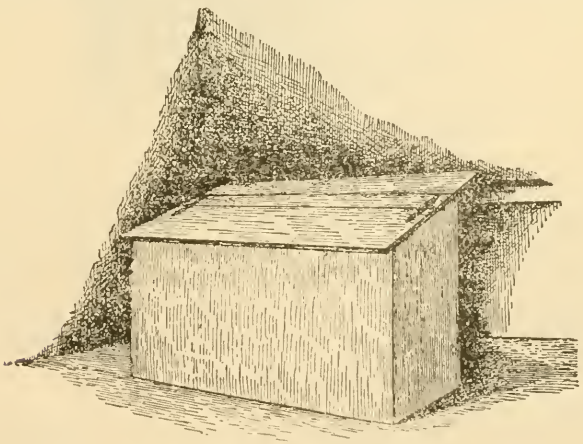


Fig. 9—Concealed or Darkened Nest

plan of the same, Fig. 3. A scratching shed may be attached to the side of this house, as in Figs. 4 and 5, which, if desired, may be inclosed in front with poultry wire, so as to keep the birds confined.

FITTINGS.—

Roosts.—The details of construction of roosts are seen in Fig. 6. The important points are nearly flat or rounded surface on the upper side and as few cracks and crevices as possible in

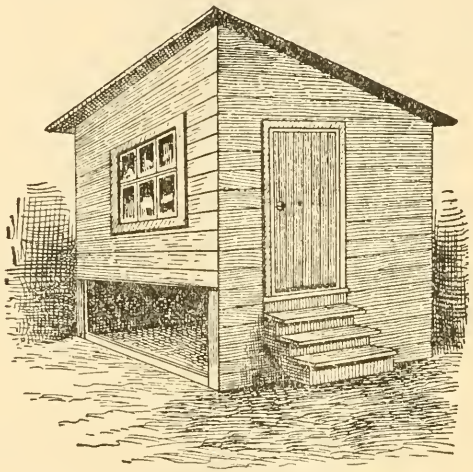


Fig. 10—Scratching Room Under Poultry House

which vermin may hide. The roosts may be made of 2 x 3 inch scantling, and should be put in so that they can be easily removed at any time for cleaning and disinfection. A platform is often placed under the roosts to catch the droppings, and the nests are placed under this platform. In the house, such as Fig. 7, the manure platform may be dispensed with and the nest boxes placed along the front or sides of the building.

Nests.—The simplest form of nest is a box placed upon the floor of the poultry house. With heavy fowls, which are apt to break their eggs in fighting away other hens that try to enter

their nests when they are laying, and thus acquire the habit of egg-eating, a more concealed or dark nest may be necessary. See Figs. 8 and 9.

Floor.—One of the most troublesome parts of the poultry house to make satisfactory is the floor. Many use earth floors, but these are often damp, especially, and induce rheumatism, colds, roup, digestive disorders, and various other diseases. Some have put in cement floors, but have found these cold and also more or less damp. Probably a good cement floor laid on

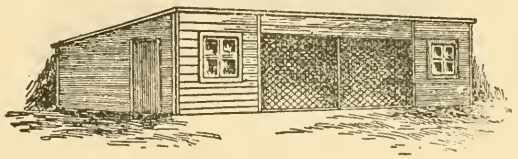


Fig. 11—Double Poultry House with Scratching Sheds

broken stone and covered with a few inches of earth, would be satisfactory if not too expensive. A board floor 6 or 8 inches above the earth, with a good ventilation under it, is dry but too cold except in the South. A good double flooring, laid tightly with building paper between, or a good single flooring covered

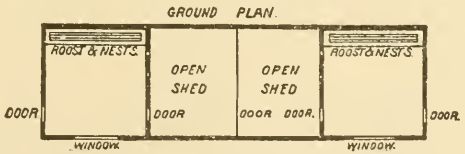


Fig. 12—Ground Plan of Double Poultry House with Scratching Sheds

with a few inches of dry earth, is probably the best. In all cases of board floors there should be sufficient space beneath for ventilation and to guard against the lodgment of rats.

GOOD PLANS.—A good style of poultry house, with scratching room under it, is shown in Fig. 10. In case more than one flock is to be kept, the plan shown in Figs. 11 and 12 have been found satisfactory, and may be mutiplied to any extent by

adding to the ends. With such houses there may be fenced runs at the back or front, or on both sides, so that the birds may be kept confined.

SPACE TO BE ALLOWED.—The amount of space to be allowed to each bird depends upon the size of each bird, whether a shed is attached to the house or whether the fowls

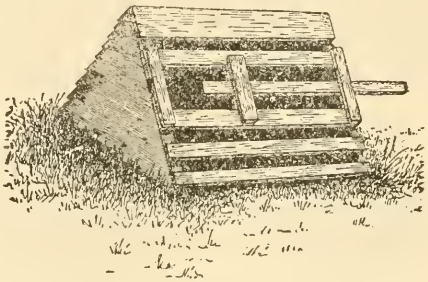


Fig. 13—Common A-shaped Coop with Sliding Slat

have a free run of the open fields. For birds in confinement there should be from 6 to 15 square feet for each adult bird in case there is no shed attached to the house, and with a shed this space may be reduced about one-half. The yards should be large enough to allow exercise in the open air, and to furnish more grass than the birds will eat. This will vary from 60 to 150 square feet per adult fowl. The open shed facing the south, where the birds can be induced to hunt for their food and take

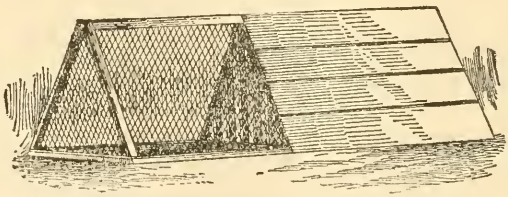


Fig. 14—Chicken Coop with Inclosed Run

exercise at all seasons of the year, and where they can enjoy the pleasure of scratching and dusting themselves in the sunshine, even in winter months, is of great assistance in maintaining the

health and productiveness of the flock. The roosting space allowed should be 6 to 8 inches for the smaller breeds, 8 to 10 inches for the medium breeds, and 10 to 12 inches for the larger breeds.

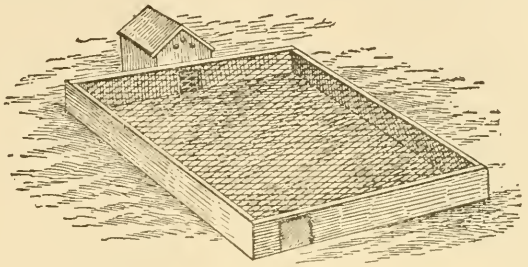


Fig. 15—Chicken Coop with Large and Inclosed Hawk-proof and Cat-proof Run

VENTILATION.—Poultry houses should be well ventilated, but so arranged that drafts will not strike the birds. Windows and doors should be provided in such locations that the sun may shine into the building a considerable part of the day. Sunshine is required both to keep the house dry and to destroy the various forms of infection.

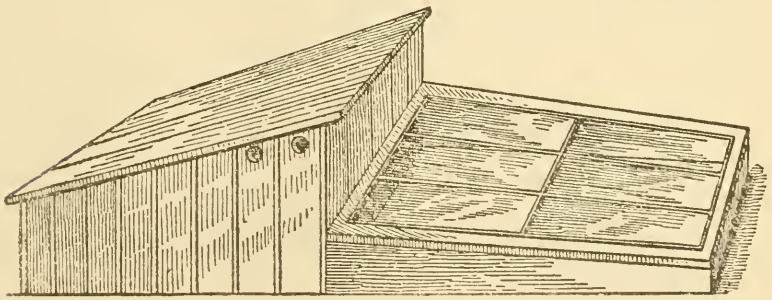


Fig. 16—Coop with Glass-covered Run

POULTRY COOPS.—A liberal supply of coops should be provided for the confinement of hens with broods of small chicks, and for those hens which insist upon setting at inconvenient times. A few days in solitary retirement will usually break up the desire to set, and the hens will soon after resume laying.

A common A-shaped coop is one of the easily constructed and convenient forms in use. The one disadvantage connected with it is the difficulty of removing the feeding and drinking vessels for cleaning, or of catching a bird in it without danger of some other bird escaping. To obviate this, one of the slats may be made to slide, as in Fig. 13. The opening made by sliding this slat is sufficient to admit the hand and arm so that any part of the coop may be reached without leaving an avenue of escape unguarded. Other forms of coops for the same purpose are shown at Figs. 14 and 15. For early hatched chicks, which come out when the atmospheric temperature is so low as to be injurious to them, a combination of coop and glass-covered run, as shown in Fig. 16, has been found very useful.

FEED TROUGHS AND DRINKING FOUNTAINS.—Two forms of feed troughs are represented in Fig. 17. For the small chicks the troughs must be very shallow, or for the few

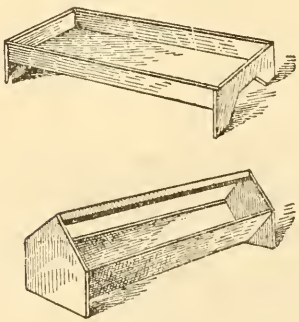


Fig. 17
Two Forms of Feed Troughs

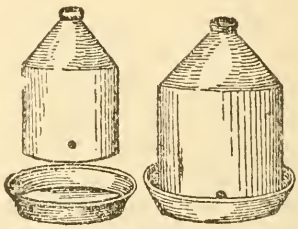


Fig. 18
A Drinking Fountain Made of a Can

days the feed may be placed upon a square piece of board. Numerous forms of drinking fountains have been devised. A good fountain is easily made by cutting a small hole in a tin can, as shown in Fig. 18, filling the can with water, covering with a shallow pan or vessel of any kind, and then inverting the whole. The shallow vessel will remain filled with water as high as the top of the aperture until the can is exhausted. It is important

that fresh, pure water should always be accessible to fowls, and the drinking fountains should be cleaned and filled two or three times a day, if possible, and under no circumstances less frequently than once a day.

RANGING OF FOWLS.—Poultry may be raised with the greatest economy on the large farms of the country, where there is unlimited range, and exhaustless supply of insects and worms, and an abundance of seeds and grains going to waste

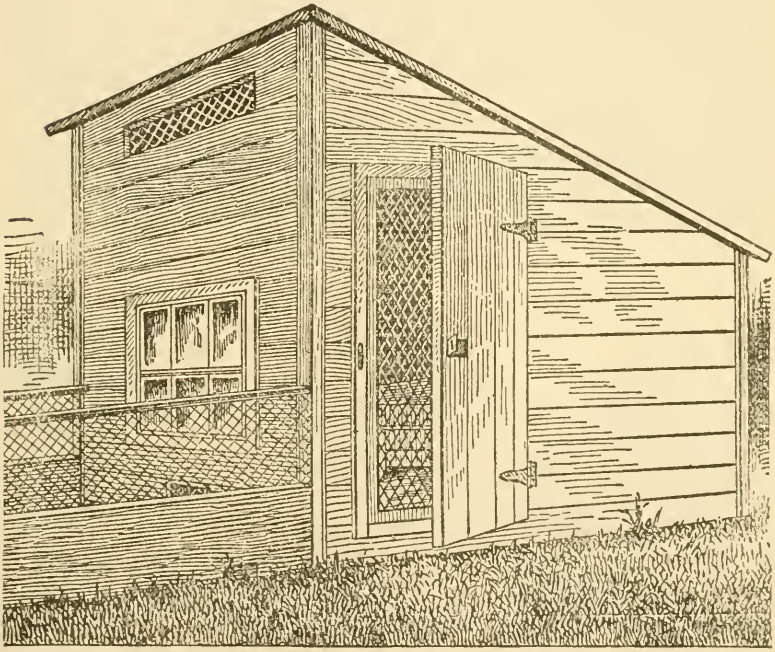


Fig. 19—Colony House

which poultry alone can utilize. Under such circumstances fowls take care of themselves so well and are so energetic in seeking their food that they are either forgotten and allowed to shift for themselves when they really need attention and assistance, or they are regarded as a nuisance because they do a little damage.

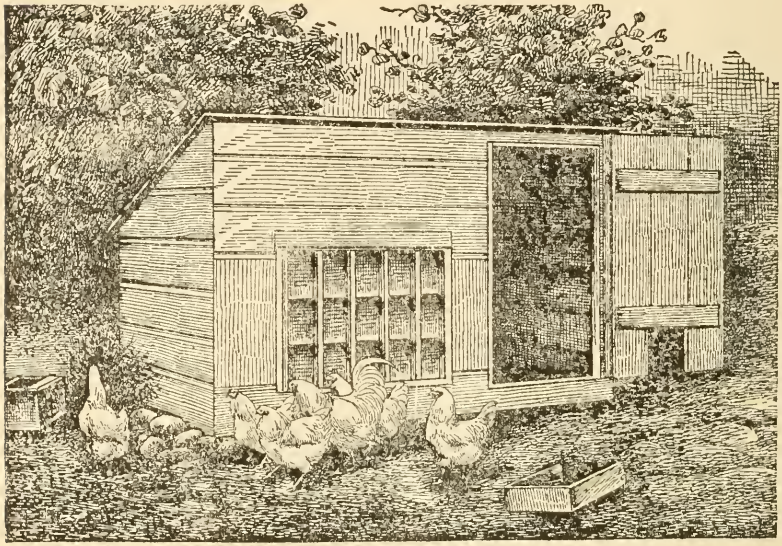


Fig. 20—Colony House

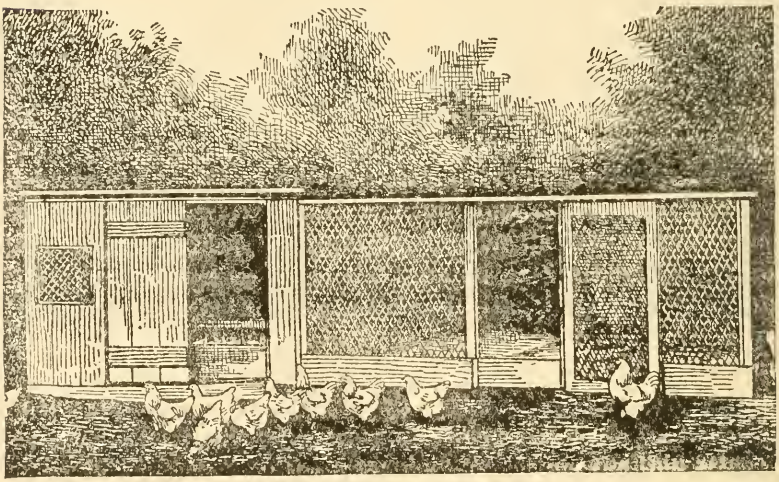


Fig. 21—Colony House

When fenced away from the gardens and flower beds, fowls do little damage and cause scarcely any annoyance on a farm. On the other hand they do an immense amount of good in the protection of crops by the destruction of injurious insects, larvae and worms.

COLONIES.—Sometimes it is advisable to divide the farm flock into colonies, and place these at different points on the farm, in order to secure additional range; to remove the birds temporarily to a distance from certain crops, or for other purposes. In this case cheap, light and easily handled colony houses (Figs. 19, 20 and 21) may be constructed and placed where the fowls are desired to range. After being confined in these houses a few nights the birds will adopt them as their habitations and return to them.—*U. S. Bulletin.*

A TEN DOLLAR POULTRY HOUSE.—A cheap and at the same time substantial poultry house, containing 100 square feet of floor space, can be built for ten dollars by any man or boy of ordinary ingenuity. All the tools needed are a saw, hatchet, square and screw driver. These are usually the property of any householder. The materials used are:

200 feet of 8-foot fencing, at $14.50	$ 3 48
200 feet of 10-foot flooring (2d quality), $16	2 96
4 ten-foot boards, 12 inches wide, at $18	72
3 two-by-four scantling, 10 feet long	21
2 bundles lath	30
2 second-hand sashes	1 00
20 pounds tar paper, at 3c	60
1 pair half-strap hinges	15
Nails, etc., and paint	58
Total	$10 00

The fencing comes 6 inches wide, and the flooring about the same width. No posts are used in this plan, and the house is none the less strong. To construct it, first saw twenty of the fencing boards to 6 feet long for the back of the house, and saw the waste ends of these to 2 feet long. Rip one of the 12 inch boards into two 6 inch boards, one of which is for the base of the

back of house, and the other is to be again ripped into two 3 inch strips, upon which nail the 2 feet fencing pieces, leaving two pieces loose near each end of the doors. This forms the base of

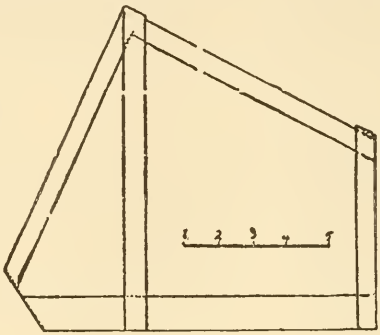


Fig. 1

the front. The base of the whole house can now be nailed together, using two of the wide boards for the sides.

The front base slants outward (see Fig. 1). The frame is then constructed by erecting a long fencing board at three feet from the front end of each side base and a shorter one at rear end of each, as Fig. 1, which shows these boards trimmed to fit

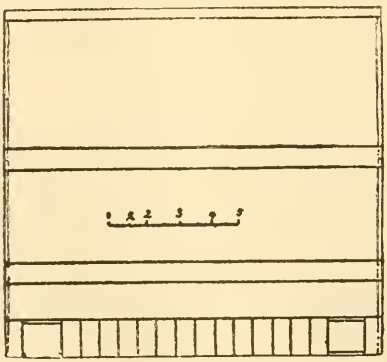


Fig. 2

under the roof. These two sets of uprights are then connected by scantling for the roof; under the ends of these scantling fencing boards are nailed, which hold the third scantling in place to support the center of the roof. The top of the longest board is

then connected with the front base by a fencing board, and two boards nailed across the front to support the sash. The whole frame is then complete.

Figs. 1 and 2 show the full details of the frame. The boards for back, sides and roof can then be nailed on, flooring boards being used for roof. When the sashes are adjusted in their proper places on the front, with strips of tin above them to turn water, flooring boards are sawed to proper length and fitted on. The ventilator is made with four flooring boards· its lower end is near the floor at center of house.

The remaining 12 inch board is for base of the partition, a narrower board for top and lath nailed on close, divides the house into two compartments for two pens for fowls, or a pen of fowls and room for young chicks, or two rooms for young chicks of

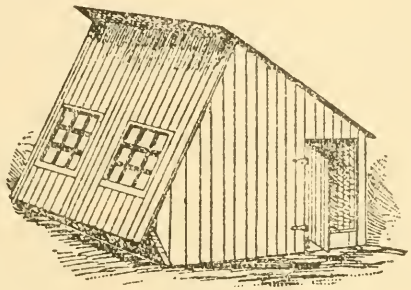


Fig. 3

different ages. The cracks on sides and back of house are stripped with lath; the inside of house is lined with tar paper, and the roof and front painted with a cheap mineral paint, which renders the house waterproof, as the boards are tongued and grooved. This makes it warm enough for almost any latitude. For the south the strips and tar paper might be dispensed with. The slant of sash is sufficient to shut out the perpendicular rays of the sun in summer and flood the whole floor with warmth in winter.

An outside door and a gate in the partition makes the whole house of easy access. The small doors for fowls are made on the trap door principle, and open and close by a cord attached to

the fastening bolt, which is heavy enough to fall into place when the cord is slackened. Sufficient scrap pieces will be left to make feed, dust and nest boxes, and the inside arrangements can be made to suit the owner. The floor is earth, packed hard and covered with gravel; on top of which for young chicks scatter grass.

It will readily be seen this plan can be extended an indefinite length by the addition of three posts every 10 feet to support the roof.—*American Poultry Journal.*

POULTRY POINTERS.—A successful raiser of poultry gives the following pointers in the *Standard American Poultry Book:*

In raising poultry or stock of any kind it should be the aim of everyone to keep it healthy and improve it. You can do it very easily by adopting some systematic rules. These may be summed up as follows:

1.—Construct your house good and warm, so as to avoid damp floors and afford a flood of sunshine. Sunshine is better than medicine.

2.—Provide a dusting and scratching place where you can bury wheat and corn, and thus induce the fowls to take a needful exercise.

3.—Provide yourself with some good healthy chickens, never to be over three or four years old, giving one cock to every twelve hens.

4.—Give plenty of fresh air at all times, especially in summer.

5.—Give plenty of water daily, and never allow the fowls to go thirsty.

6.—Feed them systematically two or three times a day. Scatter the food so they can't eat it too fast or without proper exercise. Do not feed more than they will eat up clean, or they will get tired of that kind of feed.

7.—Give them a variety of both dry and cooked feed. A mixture of cooked meat and vegetables is an excellent thing for their morning meal.

8.—Give soft feed in the morning and the whole grain at night, except a little wheat and cracked corn placed in the scratching places to give them exercise during the day.

9.—Above all things, keep the house clean and well ventilated.

10.—Do not crowd too many into one house; if you do, look out for disease.

11.—Use Carbolic Powder occasionally in the dusting bins to destroy lice.

12.—Wash your roosts and bottom of laying nests, and whitewash once a week in summer and once a month in winter.

13.—Let the old and young have as large a range as possible, the larger the better.

14.—Don't breed too many kinds of fowls at the same time, unless you are going into the business. Three or four kinds will more than keep your hands full.

15.—Introduce new blood into your stock every year or so, by either buying a cockerel or a setting of eggs from some reliable breeder.

16.—In buying birds or cages, go to some reliable breeder who has his reputation at stake. You may have to pay a little more for birds, but you can depend on what you get. Culls are not cheap at any price.

17.—Save the best birds for next year's breed, and send the others to market. In shipping fancy poultry to market send it dressed.

ARTICLES OF POULTRY DIET.— Potatoes are rather poor food used alone, contributing almost nothing to the fatty tissues, and very little, if anything, to the growth of bone. They are, however, quite useful, if boiled and mashed up with other things which can supply that which they lack. Indian corn or oatmeal are good things to mix with them.

Broom-corn seed is sometimes fed. It will not be eaten whole, at least not with great relish, but must be ground.

Green-cut bone is excellent for the fowls, as they enjoy it, but care should be taken to see that the bones are fresh.

Scalded curd may sometimes make up a part of the poultry bill of fare.

Brewers' grains, if fed alone, cause diarrhea. If kept on hand they are liable to ferment. To prevent this, put them into a hogshead two-thirds full, and fill up with cold water. The grain was waterlogged before, and a little more water does no harm.

Fine hay, or rowen, or clover, or alfalfa chopped, and then soaked or scalded, is excellent for winter use.

Cocoanut meats—namely, the outer part of the kernel—dried (ground), are prepared at the factories, and sold at a rate not much higher per pound than pork scraps. Fowls are said to relish them highly.

Hemp seed, in limited quantities, is used to give a gloss to the plumage. It makes the plumage of quails black. If fed daily it is injurious to poultry.

Millet is excellent for small chickens, being easily swallowed by them. Sunflower seed may be fed freely. It promotes laying, increases the gloss of the plumage, and the general health.

Charcoal must be furnished in small pieces. In some circumstances fowls crave it and will devour it with avidity. Fowls enjoying a free range seldom care for it, however, which indicates of course that they do not need it.—*Poultry World.*

THE CHILDREN'S FRIEND—A GOOD DOG.

THE DOG

DISEASES AND THEIR TREATMENT

Much of the sickness occurring among dogs is due to ignorance as to cleanliness and the proper method of feeding.

One of the most important things to be considered in the care of a dog is his feeding. The same general rule may be observed in the feeding of dogs, no matter what breed they may belong to, though the character and quantity of the food should differ somewhat, according to the breed of the dog and the use to which he is put.

Small house or pet dogs certainly do not require the same amount of nutrition that hunting dogs do, as in the former there is little waste of tissue, while in the latter, from the violent character of the exercise he undergoes while at work, there is great waste of tissue, which must necessarily be supplied through the diet.

One general rule may be observed in the feeding of all puppies, no matter what may be their breed, from the time of their weaning until they reach the age of maturity, which varies somewhat according to breed. For instance, the smaller breeds, such as toy terriers and pet dogs, mature at the age of about fifteen months, whereas the larger breeds, such as mastiffs and St. Bernards, are hardly thoroughly matured at the age of two years.

THE PROPER FOOD FOR PUPPIES.—Puppies are usually weaned at the age of five or six weeks. For about three weeks after that time it is advisable to keep them almost exclusively on a milk diet, allowing a little stale bread which may be broken in the milk, which should always be well boiled, as sweet milk unboiled not only engenders worms, but also is liable to cause serious looseness in the bowels, owing to the marked

difference between the cow's milk and that furnished by the puppy's mother. The former lacks the sugar of milk which strongly predominates in the mother's milk.

After the third week soup may be allowed, also a small quantity of well cooked meat, chopped fine. As the character of the puppy's stomach changes, so must his food. The best soup is beef or mutton broth. From this time on vegetable diet may be gradually introduced.

The old, fallacious idea of feeding puppies on milk and meal has long since been abandoned by the best informed breeders.

For as the dog is by nature carniverous I consider he requires some meat diet to enable him to enjoy perfect health and strength, and it is especially requisite that while a puppy is growing he should be provided with such food as will make bone and muscle. We frequently find defective nutrition in the bone structure, causing what is generally termed Rickets, which is made evident by crooked limbs and enlarged joints. This malady may be prevented by giving in the food Carbonate and Phosphate of Lime, which are bone making materials.

From the age of six months to one year puppies should be fed not less than three times daily. Thereafter twice a day is sufficient, feeding lightly in the morning and making their evening meal the chief one, as digestion goes on much better in a dog while at rest than in action.

FOOD FOR GROWN DOGS.—No dog in health can be fed better than from the scrapings from the table, whereby he gets a variety of diet, consisting of meat, bread and well cooked vegetables of all kinds. Potatoes are not so easily digested by dogs as other kinds of vegetables, and consequently should be well mashed. From the fact that a dog's stomach closely approaches in character that of a human being, one may say that what is good for a man is good for a dog.

The old idea of keeping dogs on corn meal to a great extent is a very erroneous one, as it not only is deficient in nutrition, but is also very heating to the blood.

Dogs require some cooling food, which is only obtained through a vegetable diet.

A pet dog of course requires a small amount of food compared with that needed by a hunting dog. The latter may be allowed all the meat they can consume while they are at work, for in no animal is the waste of tissue so rapid as in this dog.

A dog taken into the field in the morning comparatively fat will return at night after a hard day's work showing a loss in weight of between three and five pounds, enough to make the animal appear thin.

HINTS ABOUT KENNELS.—To begin with, kennels should be kept scrupulously clean and disinfected as frequently as is necessary, which is probably once or twice a week. I consider the most effective germicide to be a solution of Bichloride of Mercury—Bichloride of Mercury, 1 part; Water, 1,000 parts; use with *caution;* or Creolin—sufficient is used to turn water white. The Creolin solution is non-poisonous and is very good.

Kennels should be located on high, dry ground having proper drainage, as dampness is apt to cause rheumatism.

Dogs should at all times have access to fresh, cool water.

As a summer bedding, nothing is better than cedar or pine shavings, as fleas do not take kindly to the odors of these woods.

Regular exercise of at least two hours a day is almost imperative to a dog's well-being. Few if any dogs kept in the city get this amount of exercise, and are in consequence more liable to sickness than dogs kept in the country, especially those that are at liberty at all times.

No dog should have a chain put on him before he is one year of age, except sufficiently to chain-break him. A dog raised from puppyhood on the chain, which is a direct contradiction to nature, will, by pulling on the chain, combined with a lack of exercise, become ill-shapen in limbs and body. It is exercise and good feeding which develop our most perfect specimens.

EXERCISE AND GROOMING.—Once a week is quite often enough for a dog to be washed, first using tepid and rinsing with cold water. He should then be rubbed as dry as possible and encouraged to play or exercise until he is thoroughly dry.

In order to keep a dog's coat in nice condition he should be groomed daily, using a stiff bristle brush, which is far preferable to the wire brushes sometimes used for that purpose, as it does not irritate the skin, but improves the capillary or surface circulation.

The above rules apply generally to all dogs.

H. Clay Glover, D.V.S.

DISTEMPER.—This is the bane of the canine. It is very common in dogs from three to six months of age, but afflicts them at all ages, especially during the fall, winter and spring months. It is contagious.

Causes.—It is caused by a parasite or germ getting into the blood.

Symptoms.—There is langor, loss of appetite and redness of eyes; nose hot and dry; urine high colored; bowels sometimes constipated and sometimes loose, but discharges always offensive; there is much disinclination to move. In a few days hair becomes dry; there is discharge from nose, eyes, and sometimes from penis. Symptoms become more aggravated. If bowels are the seat of complications there will be black, offensive feces, streaked with mucus. If skin is affected there will be pustules inside the thighs, arms and along the belly; these fill and discharge a dark watery matter. If in the brain, there is great heat; a desire to raise head up against hand when stroking, and fits usually follow.

TREATMENT.—

The treatment is simple. Isolate dog from all companions in a dry, warm room with good ventilation, and encourage appetite by nourishing foods, such as broths, new milk, etc. At the outset of the disease give a teaspoonful of the following mixture:

Tincture of Aconite	1½	drachms.
Spirits of Niter	2	ounces.
Muriate of Ammonia	1½	drachms.
Chlorate of Potash	3	"
Syrup of Orange Water to make.	4	ounces.

Give as above every two hours until 6 doses have been given; then four times a day until fever subsides.

Follow this with equal parts Saltpeter, Sulphur and Powdered Gentian, by weight; mix thoroughly; give a large dog ½ teaspoonful three times a day in milk or on tongue, and allow him plenty of fresh water to drink; wash discharges from his nose and eyes and afterward dry them with a soft cloth. If bowels are costive, give from a teaspoonful to a tablespoonful of the Syrup of Buckthorn, according to size, once a day until the bowels move freely; then once or twice a week to keep them in condition, but never use drastic purgatives. Treat complications which may arise, as Chorea, Fits, or Lung troubles, as directed under those headings.

COLDS, COUGHS AND LUNG DISEASES.—Dogs often catch cold, cough, run at the nose, sneeze and have considerable fever, which condition, if neglected, may run into pneumonia. If taken at the start, give:

Tincture of Aconite Root.....½ drachm.
Water..... 4 ounces.

Mix and give 1 teaspoonful together with 2 or 3 grains of Quinine three times a day.

If the affection has run on into a cough and discharge from the nose, rub Mustard paste well into the throat and give:

Tincture of Aconite Root.....½ drachm.
Syrup of Squills..... 1 "
Syrup of Ipecac..... 2 drachms.
Spirits of Niter..... 3 "
Water to make..... 4 ounces.

Mix and give 1 teaspoonful three times a day.

If the lungs are affected and there is a short, distressing cough and rapid, painful breathing, accompanied with a slight grunt at each expiration, apply Mustard paste to the sides, rubbing it well into the hair and covering to retain the fumes. After an hour sponge it off with tepid water and repeat the application. Give the following until the fever is broken:

Tincture of Aconite Root..... 30 drops.
Sweet Spirits of Niter..... ½ ounce.
Tincture of Gentian..... ½ "
Syrup of Tolu..... 2 ounces.
Water to make..... 4 "

Mix and give 1 teaspoonful every two hours.

When fever is gone, give:

Elixir of Calisaya, Iron and Bismuth	2 ounces.
Syrup of Tolu	2 "
Chlorate of Potash	3 drachms.
Water to make	6 ounces.

Mix and give 1 tablespoonful every three or four hours.

Continue the Quinine right through. Feed lightly and see that there is good ventilation, but avoid drafts and have a temperature of about 60 to 62.

FITS.—This is a common ailment in a dog, owing to a highly developed nervous system.

Causes.—Worms; indigestion, overeating, etc.

Symptoms.—There is champing of jaws; frothing at the mouth; delirium; the dog falls, works his legs violently, and after a minute or so gets quiet; very soon gets up, shakes himself, looks around rather wildly as though bewildered for the moment, and in a few moments is as well as ever until another comes on. Each fit weakens him more and more, and he may finally die from exhaustion.

TREATMENT.—

Nothing can be done until the fit is over. Then give a dose of Castor Oil—1 to 3 tablespoonfuls, according to size of dog—and inject into rectum the following:

Sulphuric Ether	1 ounce.
Laudanum	1 "
Water	2 ounces.

Mix and inject 1 teaspoonful into the rectum occasionally.

After one-half hour begin on the following:

Bromide of Potash	2 drachms.
Water	6 "

Mix and give 1 tablespoonful until the Oil operates.

Should there be more fits, continue for twelve hours longer. If fits do not return, give three times a day for a couple of days. If worms are suspected treat for them.

GOITRE, OR SWELLED NECK.—This is an enlargement of the thyroid gland, situated at the side of the neck, two or three inches from the throat. It has been known to grow as large as the fist, and frequently interferes with the breathing by pressing on the windpipe. May be on both sides.

TREATMENT.—

Paint it once a day with the Tincture of Iodine, or instead of that:

Iodide of Potash	2 drachms.
Lard	2 ounces.

Mix and rub it on once a day.

Will usually yield to treatment in a few weeks.

DIARRHEA.—This is not a very common disease in dogs, but is sometimes produced by a change of food.

TREATMENT.—

Keep the dog quiet and give him boiled milk with a little dry flour in it, and in many cases this will be sufficient. If this is not sufficient give a large dog:

Laudanum	½ drachm.
Whiskey	1 tablespoonful.
Boiled Milk and Flour	½ cup.

Repeat three times a day until well.

Sometimes a dose of Castor Oil at the outset will be effectual without treatment. Proper care and surroundings should supplement the treatment.

CONSTIPATION.—This is quite a common disease among dogs.

Symptoms.—There is little or no action of the bowels; dog strains, and what little is passed is hard and dry. Is dull and will not eat.

TREATMENT.—

Give a large dog a dose of Castor Oil, ½ ounce, repeating in ten hours if bowels do not move. Soapy water injections may also be used to assist action. Or, give to a large dog ½ ounce

Syrup Buckthorn, night and morning, until bowels move. Give new milk for food and see that he has moderate exercise. Encourage dog to eat Oat Meal, well cooked, and vegetables; well cooked Liver is also beneficial.

INFLAMMATION OF THE BOWELS.—

Causes.—Eating caustic substances; from poisons, or from lying too long on cold, icy ground.

Symptoms.—There will be whining; uneasiness; frequent getting up and down; pain on pressure of the belly; high fever; rapid pulse; hurried breathing and constipation.

TREATMENT.—

First, give ½ ounce Castor Oil with a tablespoonful Olive Oil in it to a large dog. In a half hour give the following:

Tincture Aconite Root..... ½ drachm.
Water. .... 4 ounces.
Mix, give 1 tablespoonful of mixture and repeat every half hour.

Give $\frac{1}{20}$ to ¼ grain of Morphine every three to four hours to allay pain, and apply a Linseed Meal poultice, with a tablespoonful of Mustard in it, wet up with hot water, to the bowels. Injections of warm water are helpful.

WORMS.—The two principal kinds of worms that trouble the dog are tapeworms and round worms, and we give treatment for those.

Symptoms.—The general symptoms of worms are: Generally a good appetite, but does not thrive; dry, staring coat; cough, with a desire to vomit; sometimes vomit worms; diarrhea or constipation; sometimes worms seen in manure; if badly affected or reduced, fits are apt to follow. In some instances there may be bloody passages and a pot-bellied look.

TREATMENT.—

For round worms give every morning for a week before feeding the following:

Santonine..... 4 grains.
Sulphuret of Iron..... 2 "
Sugar of Milk..... 20 "
Powder and mix and give as one dose.

Follow the last dose with a dose of Castor Oil, 2 tablespoonfuls, with 10 drops Turpentine in it. Repeat the treatment at the end of three weeks. Or, give ½ drachm Oil of Male Shield Fern in 4 tablespoonfuls Milk every third day until bowels move well and animal is free of worms. Put well back in his mouth and hold his head until swallowed.

For Tapeworm have the dog fast for 24 hours, and then give him 1 drachm Areca Nut, coarsely powdered, and made into a pill with syrup. In four or five hours give 2 tablespoonfuls Castor Oil, and when it has operated give:

Male Shield Fern..... 20 drops.
Olive Oil..... 1 tablespoonful.
Mixed together.

Examine passages carefully to find head of tapeworm, and if this does not come away, repeat after two weeks. This dose is for large dogs; give small or young dogs proportionately less.

MANGE.—Mange is caused by a mite-like organism that burrows into the skin. It spreads all over the body, but mostly affects the skin on the back, head and neck. It will spread by contagion, even to human beings.

Symptoms.—There is intense itching, and the dog will scratch, rub and bite himself until the hair falls off, and in some cases the skin gets so sore and irritated that it will bleed. It usually appears first on elbows, fore legs, around eyes, on belly, in the flanks, and down inside the thighs, but soon spreads to all parts of the body, being characterized by a reddish, pimply eruption, with scaly patches between pimples, and by loss of hair. There is also a disagreeable odor.

TREATMENT.—

Clip off hair and wash thoroughly with soapy water; rub dry and apply the following wash, rubbing into the skin all over the body:

Creolin..... 2 tablespoonfuls.
Water..... 1 pint.
Repeat once a day until the dog stops scratching himself, skin heals and hair starts out.

In addition give a large dog 1 teaspoonful of Sulphur in milk twice a day. Or, instead of Creolin, make an ointment of:

Sulphur ..... 2 ounces.
Lard ..... 2 "

Mix and apply once a day; but washing need not be repeated unless more than four applications are required.

In case of prolonged treatment, wash every fourth day. Use discretion about washing and clipping when weather is cold. The kennel must be thoroughly renovated and disinfected, using boiling water and soap, and solution of Carbolic Acid, or one part Corrosive Sublimate to 1,000 parts water, to destroy germs.

RINGWORM.—

Cause.—A parasite that causes considerable local irritation.

Symptoms.—The elevation of the skin in the form of a ring, which spreads by the ring increasing in size, the skin becoming scaly and rough, and soon the hair drops off.

TREATMENT.—

Wash with soapy water and apply the following:

Oil of Tar..... 1 ounce.
Whale Oil..... 20 ounces.

Mix and rub in well.

This remedy is also good for Mange.

FLEAS.—These are very troublesome to dogs, and occasion him *and others* a great deal of regret.

TREATMENT.—

Clean the kennel and put in clean bedding. Use Persian Insect Powder liberally, dusting down into the roots of the hair, around on carpets if dog is kept in the house, and on places where he is accustomed to lie. Or use the Creolin wash, as in Mange—2 tablespoonfuls Creolin in a pint of water, repeating every three or four days. The following ointment is also recommended:

Oil of Anise..... 1 ounce.
Olive Oil..... 10 ounces.

Mix and rub well into the hair, washing off after six hours.

LICE.—There are two kinds of lice that sometimes trouble dogs—the blood-sucking and the bird lice.

TREATMENT.—

These may be eradicated with the Creolin wash, as in Mange and Fleas, or by sifting wood ashes into the hair; by oiling the dog with Whale Oil and washing it off a few hours afterward, or washing him in an infusion of tobacco.

SORE EYES.—This is an inflammation of the eye and its covering.

Causes.—From something getting into eyes; or from a bite or scratch, or any other irritant.

Symptoms.—Eyes are red and inflamed, and after a time a film will come over the sight; sometimes the eyelids are swollen and tears run from the corners.

TREATMENT.—

Examine eye for the presence of foreign matter and remove it if found; then apply the following eye water:

Boracic Acid..... 20 grains.
Distilled Water..... 2 ounces.

Mix and apply hot to eye twice each day after bathing with hot water.

Or:

Sulphate of Zinc.....¼ drachm.
Sugar of Lead.....¼ "
Fluid Extract of Belladonna.....15 drops.
Water..... 4 ounces.

Mix and apply to the eyes after bathing with new milk.

CANKER OF THE EAR.—This is a common disease of dogs.

Causes.—Improper and high feeding; and also said to be common in dogs that run through long, wet grass.

Symptoms.—Shaking the head and scratching the ear; there is a discharge from the ear that has a bad odor; dog holds his head to one side.

TREATMENT.—

Give a vegetable diet for a time. Thoroughly syringe ear with warm water and apply Oxide of Zinc Ointment, or apply a lotion of:

Sugar of Lead	1 part.
Water	16 parts.

Let one hold the dog's head in one hand, having the root of the ear between the thumb and first finger of the other hand. Pour ½ teaspoonful into ear and close it, working it with fingers so that the liquid penetrates thoroughly. It gives no pain.

DEAFNESS.—A common trouble with old dogs, but may occur from accumulation of wax.

TREATMENT.—

If an old dog, little can be done, but if it be a young one, syringe out the ear with soapy water and drop into the ear a few drops of Olive Oil. Repeat every other day for a few days.

CHOREA.—This is a disease of the nervous system.

Causes.—It may follow an attack of Distemper or arise from an injury.

Symptoms.—There is a quick, nervous jerking of the affected part, which is most commonly the head, neck and fore parts. It may be so bad as to make the animal utterly useless.

TREATMENT.—

When once seated it is incurable, but if taken in time Bromide of Potash in ¼ to ½ drachm doses, twice a day in milk, or on the tongue with a spoon, will be found a good remedy. Or give:

Sulphate of Iron	3 grains.
Saltpeter	4 "
Brown Sugar	½ drachm.

Powdered and mixed.

Repeat night and morning for a couple of weeks.

RHEUMATISM.—This disease occurs in the dog in both the acute and chronic form.

Causes.—Exposure to bad weather; remaining idle and wet after being in the water; damp kennels; high living, etc.

Symptoms.—The attack comes on rather suddenly, the joints swell, the pulse becomes full and tense, the eyes blood-shot, stomach deranged and bowels costive. Severe pains run through the joints, tongue is coated, the muzzle hot and dry, and animal whines or howls from pain.

Chronic rheumatism is known as gout. There is pain in the parts, the muscles are tender and joints stiff, with but little inflammation. Pain seems to be eased by exercise.

TREATMENT.—

For acute forms give the following:

Extract of Colocynth	1 scruple.
Calomel	10 grains.
Powdered Gamboge	2 "
Aloes	10 "

Mix and make into four pills and give two at night and two in the morning.

The dog should be wrapped in warm blankets, and a warm bath may be used. Keep the bowels in condition by using purgatives. Plasters may be applied to the spine.

The treatment for the chronic form is similar to the acute. It consists of warm baths, warm, dry quarters, strict attention to food and in keeping the bowels in proper condition. Stimulants may be applied to parts. Spirits of Camphor is excellent, but other stimulating liniments may be used instead.

PARALYSIS.—This disease is rather common, but yields to treatment.

Causes.—Generally as a sequel to distemper, but may follow a bad cold.

Symptoms.—There is at first a staggering gait in the hind parts, which grows rapidly worse until dog has no power over them.

TREATMENT.—

Clip the hair off over the loins and apply the following to back along the spine:

Lunar Caustic	1 stick.
Water	1 teaspoonful.

Mix and apply with a camel's hair pencil.

Prepare the following:

Nux Vomica	1 drachm.
Gentian	2 drachms.
Iodide of Potash	2 "
Simple Syrup	q. s.

Mix and make into 30 pills.

Give ¼ of a pill night and morning for three days, then increase to ½ pill for three days, then to ¾ of a pill for three days, and finally a whole pill. If dog is young give until an effect is noticed in rigid muscles and stiff legs, in one-half to 1 hour after taking. If an old or large dog continue to increase dose up to 2 pills; then keep on till symptoms are noted. When giving larger doses, don't omit, or the next might kill the dog. Repeat blister if needed. Feed nourishing food, keep clean, and keep bowels open with occasional doses Castor Oil.

RABIES, OR HYDROPHOBIA.—This disease is the effect of a specific blood poison introduced by innoculation in some way. It is also thought to arise spontaneously in hot weather among some animals. The bite of another dog is the common means of conveying the disease.

Symptoms.—It comes on gradually. At first a nervous uneasiness, a melancholy look, an unusual fondness for the master, and a quiet, subdued manner in actions with a loss of playfulness. This changes to a wild expression of countenance, and an inclination to hide; may be called out, but will seem scared and run back; if poked with a stick, will snap; appears very thirsty, but cannot swallow, cannot eat. In a few days symptoms will develop and he will become a tramp. If shut in, will go round and round as if wanting to get out. If out he will walk off, snapping and biting at everything that comes in the way, injuring his mouth so that the froth that hangs from the jaws is streaked with blood. He howls dismally once in a while. The tongue gets black, the lower jaw often drops and tongue protrudes, and though in his paroxysms he will close his jaws enough to bite, he cannot howl. Symptoms grow worse till death.

TREATMENT.—

Kill the dog. In case a valuable dog is known to have been bitten, cut out a piece where bitten and cauterize the wound with Caustic Potash, Nitrate of Silver, or a red-hot iron. The animal should be kept chained till all danger of madness is past—not less than six weeks.

SURFEIT.—Dogs that are kept in close confinement and over-fed are subject to surfeit, as shown by plethora, pimples on the skin, and sometimes in a mild form of fits or vertigo.

TREATMENT.—

Reduce feed, give more exercise and give 1 drachm doses of Jalap made into pills with Syrup.

ABSCESSES AND TUMORS.—These frequently occur in weakly dogs that have been run down by disease, and from impure blood. Tumors are common in puppyhood.

TREATMENT.—

Poultice, and when ready to open lance and let out contents. Inject this lotion three times a day:

Carbolic Acid	2 drachms.
Water	1 pint.

Mix.

If animal is run down in condition give:

Sulphate of Iron	3 grains.
Saltpeter	4 "
Brown Sugar	½ drachm.

Mix. Repeat night and morning for a week.

If dog is in good condition give instead:

Cream Tartar	1 tablespoonful.
Water	½ pint.

Mix and give 2 tablespoonfuls every morning.

FRACTURES AND WOUNDS.—Dogs often get bones fractured in various ways—as a kick from a horse, or by being struck with something.

If the back is broken nothing can be done but kill the animal to get him out of pain. If a hip or shoulder bone is

fractured and the dog is young, keep him quiet and the bones will knit together, but there is not much chance for an old one. If in the leg, set straight as possible, and do up with splints and a starch bandage (a long strip of cloth soaked in starch water and wrung out as dry as possible), rolling it around the fractured leg so it will go above and below the break, moderately tight, and holding leg till it dries or hardens. Keep dog quiet and keep the bandage on for three or four weeks, or until healed.

In case of wounds or cuts, attend at once. If sore footed from thorns or long exposure to cold water examine, and if there are slivers or thorns remove them; and if needed, apply a poultice until inflammation subsides; then apply the following—bandaging feet loosely to prevent licking:

Sugar of Lead	1 ounce.
Water	1 pint.

Mix and bathe the parts twice a day.

If wound is torn much, secure the dog's mouth and tie his limbs; then stitch up the wound as directed in the HORSE DEPARTMENT. There are some that say that there is no need to apply lotions after dressing a wound such as this, but just leave the dog in a quiet, dark place and allow him to lick the wound, it having great healing power. If where he cannot lick it, or you do not wish him to, use the following:

Carbolic Acid	2 drachms.
Water	1 pint.

Mix and apply.

BREEDING AND LITTERING.—Bitches usually come in heat about twice a year, but some of them oftener. There is a period of nine days coming and the same going off. During that time she will take the dog about half the time. The time of gestation is nine weeks. At the end of that time she will go by herself and make a nest. As a rule, after the first pup comes the rest of litter comes soon after. The front feet and head should come together, or it should come hind feet first. Should there be a deviation, push pup back and with oiled finger bring forward lacking member or members so that it can come right. Don't meddle too much if matters go fairly well. In case

a pup remains in passage for a half hour or more, assist, but do so gently or you will injure one or the other, or both. Keep mother warm and feed easily digested food for a few days; then if there are no signs of fever, her feed may be more abundant and hearty. If appetite fails and she runs down, feed pups on boiled milk and give the mother the Sulphate of Iron tonic mentioned in Chorea. Put pups to bitch three times a day, but only for a few minutes to avoid worrying her. In case of a swollen and sore teat, or part of the udder, wash with warm water, dry and bathe with:

Gum Camphor ..... 1 ounce.
Olive Oil..... 4 ounces.
Mix.

If pups die, milk bitch two or three times a day to keep down inflammation. Pups should be weaned in from four to six weeks.

HOW TO CUT PUPPIES' TAILS.—Is usually done when about one month old. The length of tail varies with the breed. Decide on length wanted and then find a joint in the tail. Cut it through with one stroke of a sharp knife. Usually there is not much bleeding, but should there be, touch the wound with Monsel's Solution of Iron, or touch it with a hot iron to sear it over. In most cases it will be all right without treatment.

GONORRHEA.—This is not an uncommon disease in the dog and frequently comes on without any assignable cause.

Symptoms.—Will be known by the matter seen dripping from the end of the sheath, or clinging to it.

TREATMENT.—

Syringe out the parts with tepid water, and afterward with the following lotion:

Sugar of Lead..... 2 drachms.
Water..... 1 pint.
Mix and inject a little twice a day.

POISONS AND ANTIDOTES.—When a dog has been poisoned the first thing to do is to give an emetic—a teaspoonful

each of Mustard and salt, in a little warm water—just lukewarm. If this does not vomit him in a minute, repeat it, and if it still does not act, give a half teaspoon Blue Vitriol in a little warm water, or the same quantity of the Sulphate of Zinc; then give a few swallows of milk, or a raw egg, or a little Olive Oil. A tablespoonful of the last named may be given every five minutes for a half hour; also a few raw eggs. These are to moderate the corrosive or otherwise destructive action of the poison upon the tissues that line the stomach and bowels. For chemical antidotes (to counteract the effect on the blood, nervous system, etc.), refer to Poisons in the Diseases of the Horse, regulating the dose to suit the animal. A dog of average size requires about the same dose as a man, or about one-twelfth of the dose for the horse..

MISCELLANEOUS DEPARTMENT

INSTRUMENTS

*See pages 649, 650, 651, 652 for Instruments preceded by *.*

*Bistoury.—For making incisions. It consists of a handle to which is attached a blade, variously shaped, according to exact use for which it is to be put, either fixed or movable.

Catheter.—For drawing off the contents of the bladder when animal cannot make water. Is also used in treating deep ulcers, liquid being injected through it by means of a syringe. It is a round gutta-percha tube, of which one end is open, the other end being rounded, with two small holes at the side near by. It should always be oiled and introduced carefully.

Firing-Iron.—For actual cautery—burning with a red-hot iron—which though not used as much as formerly, is still useful in some classes of cases.

*Forceps.—For extracting splinters, pieces of bone, teeth, and the like; also for seizing arteries to tie them. They are pincers with long jaws. Those with a spring are preferred.

*Needles.—For sewing up wounds, etc. They are of different shapes as well as different sizes.

Probang.—A straight, flexible tube, with rounded end, for pushing substances down the throat in cases of choking.

Probe.—For exploring wounds. They are made of silver wire, with one end slightly knobbed, and are of different sizes.

Scalpel.—A surgeon's knife, straight and keen-edged. For veterinary purposes, it should be broad and strong.

Scissors.—Straight or curved, and are necessary for trimming edges of wounds, for clipping off the hair, etc.

*Seton Needles.—These are for drawing setons under the skin. Their blades are broad and curved, with a round shank twelve inches long, and with eye at the blunt end.

Shoeing Knife—Frog Knife—Drawing Knife.—Used for cutting into and paring the hoof, as in horseshoeing. It is a thin blade with a sharply-curved end, fixed on a handle, and is useful in caring for a horse's feet.

*Syringe.—There are regular horse and cattle syringes now in market. For giving small doses of liquid medicines, one that can be used with one hand is very useful. The India-rubber pipe and funnel is a good substitute in giving injections. A bulb syringe for injecting abscesses and cleaning wounds is very desirable. (For description of the Hypodermic Syringe, see page 355.)

*Trocar.—This is a simple instrument resembling an awl. It is generally provided with a hollow tube that encloses it, called a canula. It is used for puncturing the abdomen, chest, etc., the canula being allowed to remain in until the water, serum, or gas has escaped.

*Repeller.—A rod with a short, slightly-curved cross-bar at one end for repelling a fœtus, in order to make a correction when the fœtus is crowded too far back in the pelvis.

A CHEAP AND PRACTICABLE INSTRUMENT OUTFIT FOR THE STOCKMAN.—The following outfit will serve the purposes of most stockmen, and all can be selected at a moderate cost through any druggist. They should all be kept clean, in perfect order, and together in a neat case, or wooden box:

*A clinical thermometer.
*A pair of spring artery forceps.
A silver probe.
A frog, or shoeing knife.
A pair of curved scissors.
A broad scalpel. A single-bladed, medium sized jack-knife makes a good substitute.

A few surgical needles, of different sizes and shapes; some silk thread, and a little catgut. These should be kept in a leather case or roll.

*A horse trocar and canula.

*A milking tube.

A two-ounce hard rubber syringe, for giving medicine, injecting small abscesses, etc.

A plain bulb syringe, for syringing out abscesses and wounds.

A horse catheter is often of great value if one is a long way from a veterinarian.

*A graduate for measuring liquid medicines.

APPARATUS

The following are the apparatus and appliances which the stock owner will find useful to have on hand:

Drenching Bottle.—This is now generally used instead of the drenching horn of older days. It should have a long neck, and be good and strong. A champagne or ale bottle is good. Have one holding a pint and another holding a quart; also several olive oil bottles for drenching sheep and calves.

***Hobbles.**—For use in casting, or to prevent kicking. They are usually two strong ropes 25 feet long; also two strong leather straps, doubled and sewed, with a strong buckle and a ring, or D, for each. The straps are buckled to the hind pasterns, and the ropes are passed from the rings, or D's, forward through a loose collar on the horse's neck. (See "Casting" in OPERATIONS, and in CASTRATION.)

Slings.—They are not difficult to make. Take for the belly support two or three thicknesses of very stout canvas, about 28 inches wide and about 7 feet long; fasten the ends by sewing them around and tacking to smooth sticks, which are a little longer than canvas is wide, to which fasten very strong loops of rope.

Hook the loops into the hooks of a whiffletree turned upside down; fasten the lifting rope to the ring on the upper side of the whiffletree and pass the other end through a fixed pulley overhead. The girdle is kept in position by breeching and breast straps.

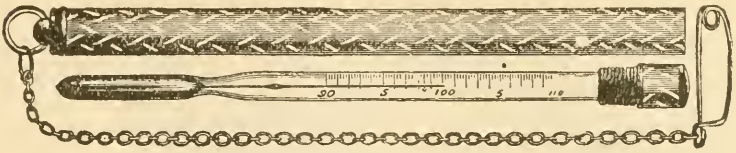
To use the sling, place it under the animal's belly and draw it up snugly against it—about tight enough to take off the stretch of the ropes. A sling cannot be used unless a horse can support nearly three-fourths of his weight; it is intended for a horse to settle into and rest himself. It is also a great help in using the slings to surround the horse with a frame. Place him with one side against a strong partition; along the opposite side, some six or eight inches from the horse, securely fasten a strong stick—a four by four or a pole; fasten the front end to the manger, the back end to something solid behind; have it pass along about the middle of the side; across from the side piece to the partition, some six inches in front of his breast, securely fasten a two by four, and the same across just back of the thighs; pad these with some old cloth. The frame prevents the possibility of the animal falling out of the sling, either forward or backward, as he will sometimes do if it is not used, and it also furnishes a support for him to lean against. If possible a sling should be lowered away from the animal for a little time each day to dry off the belly. (See cut, in HORSE DEPARTMENT.)

Sponges.—Two or three of these should be kept by the stockman, the smallest of which should be fine; the others should be larger.

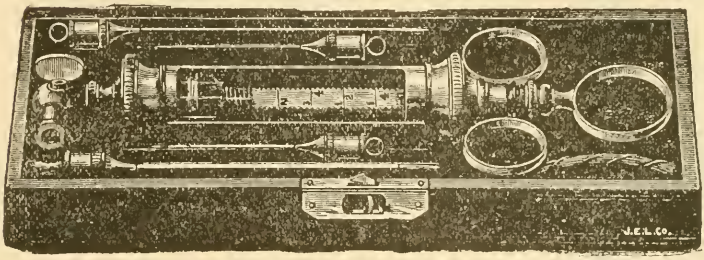
A Twist.—For controlling the horse; to make and apply, see OPERATIONS, HORSE DEPARTMENT.

Probang.—A piece of soft, one-half inch rubber garden hose, to be used as a probang in choking, for giving injections per rectum, and for flushing out the vagina and womb. Also a piece of small rubber tubing, two or three feet long, and a small funnel to use in milk fever, inflammation of the udder, etc.

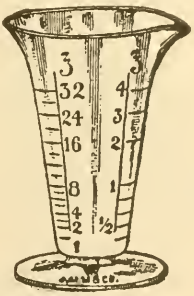
A Spring-Ring "Bull Dog" to snap in the nose of cattle for holding them.



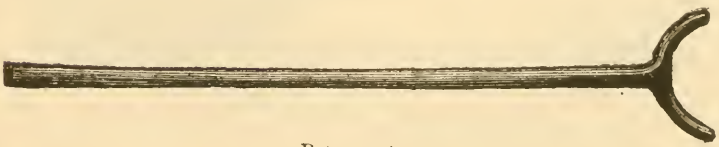
CLINICAL THERMOMETER.
For description, see page 75.



HYPODERMIC SYRINGE AND ASPIRATOR.
For description and use of Syringe, see page 355.



GRADUATE.



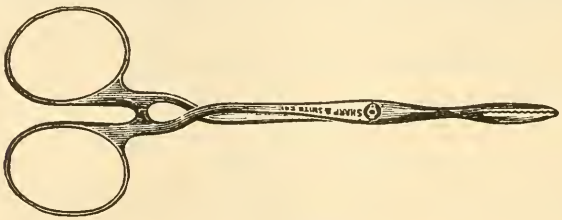
REPELLER.

NEEDLES.

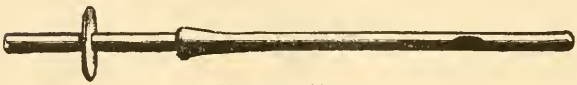
SETON NEEDLE.

PARTURITION HOOK.

PIG FORCEPS.



ARTERY FORCEPS.

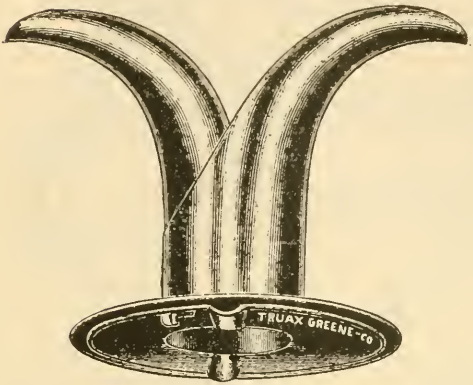


MILKING TUBE.

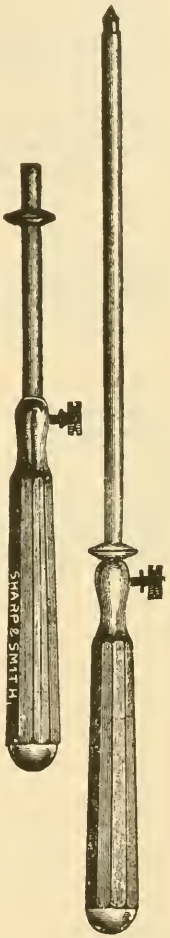
For use, see "Passing the Milking Tube," page 438.

TEAT SLITTER, OR BISTOURY.

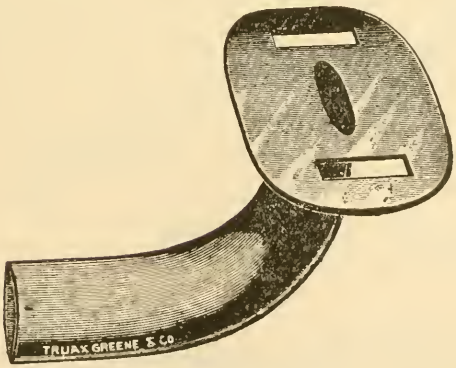
As an example of use, see in "Stricture of Duct at Base of Teat," page 442.



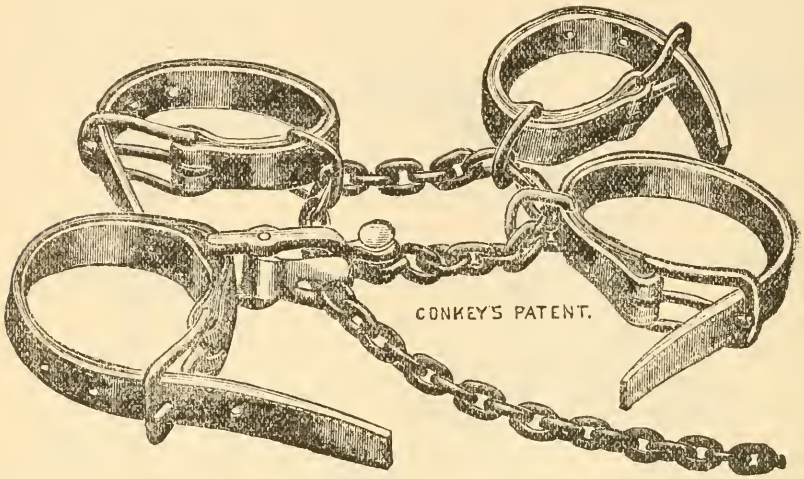
SELF-RETAINING TRACHEOTOMY TUBE.



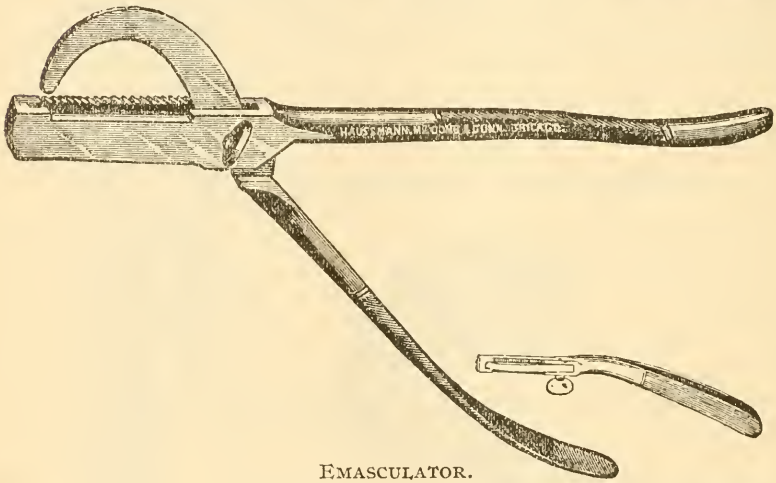
HORSE TROCAR AND CANULA.



OVAL TRACHEA TUBE.

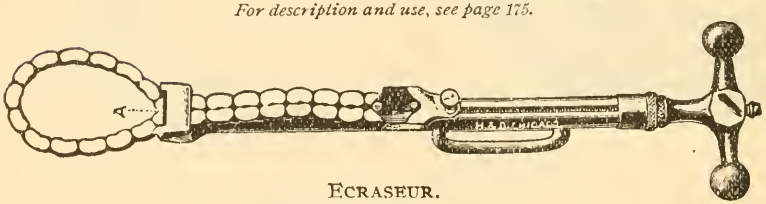


THROWING HOBBLES.



EMASCULATOR.

For description and use, see page 175.



ECRASEUR.

For one of its uses, see page 175.

MEDICINES—ACTION AND DOSE

It is not to be expected that in the brief space allowed in a section of this kind that much can be said that will take the place of experience, but at the same time something may be given that will enable one with good judgment to arrive at safe conclusions in the treatment of at least the more common diseases to which domestic animals are subject. Where one is not familiar with the action of a drug, it is best to err on the safe side and to give in small doses, repeating until the desired effect is produced. In all cases where a doubt exists, consult a veterinarian, for if an animal is worth saving at all, it is worth the advice of a man of skill and experience.

The doses described in this section are for adult animals of medium size of their class, unless otherwise mentioned, or where the disease being treated is peculiar to a certain age. The age, temperament, and size of the animal must always be taken into consideration. Animals with compound stomachs—those that chew the cud—as cattle and sheep, can take much more medicine in proportion to their size than animals with simple stomachs. As a rule, a cow will take 1½ to 2 times as much as a horse. Sheep will take about ⅓ as much as a horse; hogs, ⅛ to 1-10 as much as a horse. Dogs require about the same dose as a man. The proportionate dose for each animal, as to age, is about as in the following table:

HORSE.	OX.	SHEEP.	SWINE.	DOGS.	DOSE.
4 years,	3 years,	1½ years,	1½ years,	1½ years,	full dose.
3 "	2 "	1 year,	1 year,	1 year,	¾ "
2 "	1 year,	9 months,	9 months,	9 months,	½ "
1 year,	9 months,	6 "	6 "	6 "	¼ "
6 months,	6 "	3 "	3 "	3 "	⅙ "
At birth,	at birth,	at birth,	at birth,	at birth,	1/12–1/16 "

Allowance must also be made, in case of continued use, for decrease in effect, as the tendency is for remedies to "wear out," and have less and less effect; for effect on the individual,

as may be noticed by observing action on the particular subject; and also for the influence of the disease when it is likely to affect the action. For example, in most diseases of the brain and spinal cord, and in some impactions of the stomach, double the usual quantities of purgative medicines are necessary, while in influenza and other low fevers, half the usual dose may prove fatal. In acute congestion of the brain, narcotics, such as Opium, would aggravate the symptoms.

HOW OFTEN TO GIVE MEDICINES.—See HORSE DEPARTMENT (page 73).

SOME OF THE FORMS IN WHICH MEDICINES ARE DISPENSED.—

Powders.—A great many medicines are in powdered form; they can be given this way, if finely pulverized, in moistened feed; they can be dissolved in water, if soluble, and given as a drench; or, if not soluble, mixed with thin gruel and given as a drench.

Fluid Extracts.—A fluid extract is a liquid preparation of a vegetable product, which is of the same strength as the crude drug itself. They are made by dissolving the active principles of the drug in Alcohol, Ether, or some solvent, and then evaporating until of the strength of the crude drug. The dose of a fluid extract and the crude drug are the same. The fluid extracts are largely used for the lower animals.

Tinctures.—Tinctures are Alcoholic solutions of the various drugs. The strength varies with the different drugs, generally one-third to one-fifth as strong as the fluid extract.

WEIGHTS AND MEASURES.—In compounding some medicines it is necessary to be very exact as to weight and measure. It is best in most cases to have formulas put up by competent druggists, but where it is not convenient to do so, the farmer and stockman should have his own scales and measuring glasses, and use care in compounding. The following are the two tables of weights and measures used:

Table of Apothecaries' Weight.

20 grains make	.....	1 scruple.
3 scruples "	.....	1 drachm.
8 drachms "	.....	1 ounce.
12 ounces "	.....	1 pound.

While the above table is used by the druggist in filling prescriptions, when he sells drugs in bulk he gives 16 ounces for a pound, instead of 12 ounces. In this work, where the pound is used, 16 ounces is intended. In referring to weights, the scruple is rarely ever used, but instead, 60 grains, 1 drachm.

Table of Apothecaries' Liquid Measure.

60 minims make	.....	1 fluid drachm.
8 fl. drachms make	.....	1 " ounce.
16 fl. ounces "	.....	1 " pint.
2 pints make	.....	1 " quart.
4 quarts "	.....	1 gallon.

Where remedies are not of a violent nature, the following comparative table may be made use of, though not so accurate as above methods:

Comparative Table of Weight and Measure.

1 drop equals about	.....	1 minim.
60 drops equal	.....1 drachm, or	1 level teaspoonful.
3 teaspoonfuls equal	.....	1 tablespoonful.
8 tea- or 3 tablespoonfuls equal	...	1 ounce.
1 teacupful equals	.....	6 ounces.
1 coffeecup or tumblerful equals	...	8 ounces or ½ pint.

Acetanilid.—A white crystalline substance used to lower temperature in cases of high fever. It has a depressing action on the heart and should not be used too frequently; should always be given with a full dose of alcohol as a stimulant. *Dose:* Horse, 1 to 2 drachms; cattle, 2 to 3 drachms; sheep, 20 to 40 grains.

Acetic Acid.—Is the sour principle of vinegar, and is one of the most common vegetable acids. Pure Acetic Acid is used to remove warts. Soak the warts well in it.

Aconite.—Is derived from the root of the Aconite plant, also known as wolfsbane, monkshood, etc. It slows the action of the heart. Good for the early stages of fevers and inflammations, but should not be given when the action of the heart is weak. Applied externally it relieves pain, but should only be used in small quantities. Poisonous. *Dose* of Fluid Extract: For horse, 10 to 15 drops; cattle, 15 to 30 drops; sheep, 3 to 5 drops; swine, 1 to 2 drops; dogs, $\frac{1}{10}$ to 1 drop..

Alcohol, Whiskey, Brandy.—Good for chills, depression and collapse, or when animal is very weak. *Dose* of Alcohol: For horse, 1 to 2 ounces; cattle, 2 to 3 ounces; sheep, ½ ounce; swine and dogs, 1 to 2 tablespoonfuls. *Dose* of the others: Twice as much as the dose of Alcohol.

Ale and Beer—Stimulant. *Dose:* Horse, ½ to 1 pint; cattle, 1 pint; sheep, ¼ to ½ pint; swine and dogs, 1 wineglassful.

Aloes.—Act as a purgative, and in small doses as a bitter tonic. The kind known as Barbadoes Aloes is generally used for stock. *Dose* as a physic: Horse, 6 drachms to 1 ounce. Not used much, except with the horse; best purgative for him. As a tonic for horses, give in doses of 1 drachm. Operates in from 24 to 36 hours.

Alum.—Is an astringent that is used mostly as washes for wounds. Is also used dry, in the form of powder to dust wounds, it being very drying and healing. Is also used in gargles for sore throat, influenza, and aphtha or sore mouth. For a wash, use 1 ounce of Alum to 1 pint of water. *Dose* internally: Horses, 1 to 2 drachms, cattle, 3 drachms; sheep, ½ drachm; pigs, ¼ drachm. Used in diarrhea.

Alum, Burnt.—Used on old sores and proud flesh in the form of powder.

Ammonia Water.—Is a stimulant, and is good in indigestion, colic, and bloating. *Dose:* Horse, ½ ounce; cattle, 1 ounce; sheep, 2 drachms; dogs and swine, ½ to 1 drachm. Dilute well with water. Externally it is used for liniments.

Aqua Ammonia Fortier.—Strong Ammonia water. *Dose:* one-fourth the Ammonia water. Used in liniments.

Ammonia, Carbonate of.—Is a stimulant, prevents or allays cramps, is an antidote for acids, good in colics and indigestion. *Dose:* Horse, 1 to 2 drachms; cattle, 2 to 4 drachms; sheep, ½ to 1 drachm. Give in oil or thin gruel, as it is very irritating.

Ammonia, Aromatic Spirits of.—A flavored preparation of Ammonia Carbonate, Alcohol, and Aqua Ammonia. One of the best Ammonia preparations for internal use; good in colics, indigestions, impactions, etc. *Dose:* Horse, ½ to 1 ounce; cattle, 1 to 2 ounces; sheep, 2 drachms; hogs, 1 drachm. Dilute with at least sixteen times its amount of water.

Ammonium Chloride—Sal Ammoniac.—A mild stimulant, especially to mucous membranes. Very valuable in case of coughs. *Dose:* Horse, 2 to 3 drachms; cattle, 3 to 4 drachms; sheep ½ to 1 drachm.

Anise Seed.—Stimulates indigestion, sweetens the stomach. Is also recommended as a tonic when recovering from weakening diseases. *Dose:* Horse, 1 ounce; cattle, 1 to 2 ounces; sheep, 2 to 4 drachms; dogs and swine, 1 to 2 drachms.

Areca Nut.—The ground seed of a palm; a drug used very largely to destroy tapeworms; generally given in combination with Oil of Male Fern. *Dose:* Horse, ½ to 1 ounce; sheep, ½ ounce; lambs, 2 drachms; dogs, the dose is 2 grains for each pound of dog's weight.

Arnica, Tincture of.—Causes sweating and lessens fever. *Dose:* Horse, ½ to 1 ounce; cattle, 1 ounce; sheep, 2 drachms; swine, ½ drachm. Externally, it is mildly stimulating to the skin, and is used in liniments.

Arsenic.—White Arsenic is a heavy, white powder, very poisonous. In medicines it is used for chronic indigestion, chronic lung disorders, as heaves, and skin disorders, for all of which it is very good. *Dose:* Horse, 2 to 5 grains; cattle, 4 to 7 grains;

for smaller animals, best to use it in the form of Fowler's solution. Always commence with small dose, and increase if desired.

Arsenic (Fowler's Solution).—Is given as a tonic in chronic diseases and in heaves, and as a tonic after weakening diseases, such as distemper; it will often start animals thriving when other remedies fail. *Dose:* Horse, ½ to 1 ounce; cattle, ½ to 1 ounce; sheep, ½ to 1 drachm; swine, 5 to 20 drops; dogs, 1 to 5 drops. Give in food after eating.

Asafetida, Gum.—Good in colic, indigestion, constipation and worms. *Dose:* Horse, 2 to 4 drachms; cattle, 4 drachms; sheep, 1 drachm. Give in a ball, or dissolved in Alcohol, diluted with water.

Asafetida, Tincture of.—*Dose:* Horse, 2 ounces; cattle, 3 to 4 ounces; sheep, ½ ounce; swine and dogs, 1 to 2 drachms.

Belladonna, Fluid Extract of.—Good in fevers, cramp colic, tetanus and caked bag. Full doses should not be repeated oftener than three or four times a day. *Dose:* Horse, ½ to 1 drachm; cattle, 1 drachm; sheep, 20 drops; swine, 3 to 8 drops; dogs, ¼ to 3 drops.

Benzoin, Compound Tincture of (Friar's Balsam).—Chief use is for healing wounds, by painting over with a feather twice a day. Good to add to lard or Vaseline in making ointments—1 part to 4 or 5 parts of the lard or Vaseline. Is not used much internally.

Biniodide of Mercury.—Is chiefly used for blistering bony enlargements, such as spavins, ring-bones, side bones, splints, etc. The proportions in which it is used is 1 to 2 drachms to the ounce of lard or Vaseline.

Boric Acid.—Is a non-poisonous antiseptic. Used for sore mouth, sore eyes, roup, and also for an injection into the udder. Used in solution, 1 ounce to the pint of water.

Bromide of Potash.—Chief use is to quiet the nerves in diseases of the character of lock-jaw, convulsions, chorea, and other painful diseases. *Dose:* Horse, ½ to 1 ounce; cattle, 1 ounce; sheep, 1 drachm; swine and dogs, ¼ drachm.

Buckthorn—Cascara Sagrada.—Used mostly as a physic for dogs and cats. *Dose:* Of Fluid Extract of Cascara Sagrada, horse, 1 to 2 ounces; dogs, ½ to 2 drachms; cats, ¼ to ½ drachm. Give night and morning until results are obtained.

Butter of Antimony.—Use pure, on a swab, as a caustic to burn out proud flesh, old sores and fistulæ. Is very powerful, and must be applied to diseased tissue only. Part must be dry when it is applied. Not used internally.

Calibar Bean, Fluid Extract.—Obtained from the seed of a plant; it stimulates the activity of the bowels. Good for colic, impaction, etc.; generally combined with Jaborandi. *Dose:* Horse, ½ to 1 drachm; cattle, 1 to 2 drachms; sheep, 20 to 30 drops.

Calomel.—Internally its chief use is as a physic and to expel worms. Externally, it is dusted on old sores to dry them up and heal them. *Dose*: Horse, ½ to 1 drachm; cattle, 1 to 2 drachms; sheep and swine, 5 to 20 grains.

Camphor, Gum.—Good in colic, diarrhea, coughs, and to lessen pain. Checks secretion of milk. *Dose:* Horse, 1 to 2 drachms; cattle, 2 to 4 drachms; sheep, ⅓ drachm.

Camphor, Spirits of.—Camphor, 1 part; alcohol, 10 parts. *Dose:* Horse, ½ to 1 ounce; cattle, 1 to 2 ounces; sheep, 2 drachms; swine and dogs, 10 drops to ½ drachm. Give with water. Externally, good to relieve pain and sprains.

Cantharides.—See Spanish Flies.

Carbolic Acid.—As sold by druggists is a colorless, oily liquid; turns pink on exposure to light. Used mainly as an antiseptic and disinfectant. It is a valuable medium in the treating of wounds. Used as a 3 per cent. solution—1 ounce Carbolic Acid to 1 quart of water. Poisonous. When used internally, *Dose:* Horse, 10 to 30 drops; hogs, 3 to 10 drops; well diluted.

Castor Oil.—A most excellent purgative, and can be used where harsher ones cannot. *Dose:* Horse, 1 to 2 pints; calves, 2 to 4 ounces; sheep, 4 ounces; swine, 2 ounces. In small doses, combined with laudanum, it is a most excellent remedy for scours.

Caustic Potash.—Its principal use is to burn out warts and growths and cauterize poisonous wounds, as the bite of a mad dog; also for dehorning calves. Sticks must be kept in well-corked bottles, as air dissolves them. When used must be held in paper to prevent burning the fingers. Wet the sticks before applying.

Charcoal.—Finely powdered, is used in condition powders, and also for dusting on wounds. Hogs like charcoal to eat.

Chloral Hydrate.—A drug used to allay pain and to lessen irritated condition of the nervous system. Good to allay throes in making corrections in difficult parturitions; good to give for after-pains, for hysteria, etc. *Dose:* Horse, ½ to 1 ounce; cattle, 1 to 2 ounces; sheep, 1 to 2 drachms; hogs, ½ to 1 drachm.

Chloroform.—Is given by inhalation for the purpose of producing anæsthesia (insensibility). Must be given carefully, especially to dogs, who are very susceptible, or it will cause death. For colic in horses, 1 drachm given with laudanum is excellent.

Chlorate of Potash.—Is used internally for sore throat; when animal cannot swallow, a solution is sprayed into throat with a syringe, or put on the tongue, as a paste, with flour and molasses. *Dose:* Horse, 1 to 2 drachms; cattle, 2 to 4 drachms; sheep, ½ drachm; swine and dogs, ½ drachm.

Copperas—Sulphate of Iron.—One of the best mineral tonics, also a good astringent, in solution of 1 ounce to a pint of water, for wounds. Excellent internally for diarrhea. A leading ingredient in condition powders. *Dose:* Horse, 1 drachm; cattle, 2 drachms; sheep, 20 grains; swine, 10 grains.

Corrosive Sublimate—Bichloride of Mercury.—Used externally as an antiseptic and disinfectant. Is one of the most powerful in both lines. The proportions generally used is 1 part to 1,000 parts of water. Tablets can be bought that will enable one to mix properly to get right solution, or if these cannot be got, 1 drachm of Corrosive Sublimate to 1 gallon of water equals 1 to 1,000. Cheapest and best for disinfecting stables,

etc. The drug is very poisonous, and is not used internally, except for diarrhea. *Dose* of the 1 to 1,000 solution: Horse, ½ to 1 ounce; calves, 1 to 3 teaspoonfuls.

Creolin.—Used in the form of lotion for wounds, scratches, grease, and diseases of like character, as an antiseptic and as a disinfectant. It is also valuable to destroy parasites of all kinds. The proportions to use are from 1 to 3 parts Creolin to 100 parts of water. Should be bought pure and only mixed as needed.

Croton Oil.—A drastic and powerful purgative that is only used when milder means fail, as in impaction of the rumen, and diseases of that character. *Dose:* Horse, 15 to 30 drops; cattle, ½ to 1 drachm; sheep, 5 to 10 drops; swine and dogs, 2 to 3 drops. For horses and cattle, give in a pint of Linseed Oil; for sheep, give in ½ pint of oil; and for swine and dogs, give in 2 tablespoonfuls of Castor Oil.

Crude Petroleum.—Used in making hoof oils, and as a remedy for ring-worm on all domestic animals. Is a cheap and effective remedy.

Digitalis, Fluid Extract of.—A powerful heart and lung tonic. Used in weakening diseases, such as influenza, distemper, and lung troubles, whenever the heart is weak. It is sometimes given for heaves. *Dose:* Horse, 20 drops to ½ drachm; cattle, ½ to 1 drachm; sheep, 5 to 15 drops; swine 1 to 3 drops; dogs, ¼ to 2 drops.

Epsom Salts.—Used mainly as a purgative for cattle and sheep. *Dose:* Cattle, 1 to 1½ pounds; sheep, 2 to 4 ounces; horse, ½ to ¾ pound; hogs, 1 to 2 ounces. Dissolve in warm water. Acts in 24 hours.

Ether, Sulphuric.—Given by inhalation to produce anæthesia (insensibility). Internally as a stimulant in colic, indigestion, etc. *Dose:* Internally, horse, ½ to 1 ounce; cattle, 1 to 1½ ounces; sheep, 2 to 4 drachms; hogs, 1 to 2 drachms.

Ergot.—Checks bleeding and is used in parturition and internal bleeding. *Dose:* Horse, ½ to 1 ounce; cattle, 1 to 2 ounces; sheep, 1 to 2 drachms.

Fowler's Solution.—See Arsenic.

Gamboge.—Is a powerful physic, mostly used for cattle where milder remedies, such as Salts and Castor Oil, fail. It is generally combined with other medicines, as here given:

Epsom Salts	1 pound.
Common Salt	2 tablespoonfuls.
Gamboge	2 to 4 drachms.
Bicarbonate of Soda and Ginger, each	1 tablespoonful.

Mix in a quart of lukewarm water.

Very effective in bad cases of constipation and impactions of the stomach.

Gentian, Fluid Extract.—Used after debilitating diseases. *Dose:* Same as of the powder.

Gentian Root, Powdered.—A bitter tonic that is much used in Condition Powders, given to animals that are weak and run down. *Dose:* Horse, 2 drachms; cattle, 4 drachms; sheep, 1 drachm; swine and dogs, ½ drachm.

Ginger.—A stimulant; neutralizes gases, and sweetens stomach; is used in physic drenches to prevent griping; and is good in colic, indigestion, and many other affections. *Dose:* Horse, ½ to 1 ounce; cattle, 1 to 2 ounces; sheep, 2 drachms; pigs, 1 drachm.

Glauber's Salts (Sulphate of Soda).—An excellent purgative for animals that chew the cud—ruminants. *Dose:* Cattle, 1 to 1½ pounds; sheep, 2 to 4 ounces. Dissolve in water and give as a drench. Action same as Epsom Salts, only not quite as certain.

Glycerine.—Two to 4 ounces in warm water makes an excellent injection. Externally applied, it softens and soothes irritated parts.

Hyposulphite of Soda.—One of the most valuable drugs to check bloating, especially if the gas forms in the stomach; also given in various blood disorders; a solution of it is good to apply to mucous surfaces which are inflamed. *Dose* for bloating: Horse, 2 to 4 ounces; cattle, 4 to 6 ounces; sheep, ½ to 1 ounce. When

used for blood disorders, one-fourth to one-half the foregoing dose is used, repeated three times a day. For a wash, use 2 to 4 ounces to a pint of water.

Iodine, Tincture of.—It is not often used internally, but for external application is much used for a sweat blister for enlarged glands, wind puffs, etc., by painting parts once a day until it blisters; then grease parts and let heal; then wash with soapy water and repeat blistering until cured. Inject into old sores and fistulæ, once in two or three days. Used also in destroying ring-worms.

Iodide of Potash.—Its chief action, when given internally, is as an absorbent—as in dropsy of the belly or chest, to absorb the fluids. It is also used where there is a thickening about the throat, legs, or milk glands. *Dose:* Horse, ½ to 1 drachm, twice a day; cattle, 1 to 2 drachms. If given too long, iodism ensues; animal goes off feed, eyes and nose discharge, hair rough, skin harsh and wrinkled, dandruff in hair; if we get these symptoms, stop giving for a time.

Jaborandi, Fluid Extract.—Obtained from a plant; it stimulates the secretions of glands; good for colic and impactions, etc. *Dose:* Horse, 2 to 4 drachms; cattle, ½ to 1 ounce; sheep, ½ to 1 drachm.

Kerosene.—Internally, good for stomach worms. Give lambs 1 to 2 drachms in 4 ounces of oil or milk. Externally, it is a mild irritant. Rub it in well.

Lard.—When used fresh on irritated skin it softens and soothes. Internally, given as a purgative to small animals. Melt and give from 1 to 8 ounces, according to size.

Laudanum—Tincture of Opium.—Externally used to relieve pain. It is used internally in almost every disease that is attended with pain, as colic, diarrhea, etc. *Dose:* Horse, 1 ounce; cattle, 1 to 2 ounces; sheep, 2 drachms; swine and dogs, 5 to 20 drops.

Lime Water.—Is made by slacking fresh lime and using as much as the water will take up in solution. Allow to settle

and pour off the clear liquid. This is useful in diarrhea in young animals. *Dose:* Calves, 1 to 6 ounces.

Lime.—Finely-pulverized, air-slaked lime is good to dry up sores by being dusted on them. Unslaked lime is valuable for disinfecting stables and buildings that animals are kept in, by dusting it in dry form around on the floor. It is especially good in the poultry houses to keep away lice and other vermin; also good to use in form of whitewash.

Linseed Oil, Raw.—Acts as a very mild physic, or what is called a laxative. It is at once purgative and soothing. *Dose:* Horse, 1 to 2 pints; cattle, 2 to 3 pints; sheep, ¼ pint; calves, 4 to 8 ounces; lambs, 2 ounces; dogs, ½ to 2 ounces. Externally applied, 1 part Carbolic Acid and 25 parts Linseed Oil is good for scratches.

Mercury.—See Calomel and Corrosive Sublimate.

Monsel's Solution of Iron.—Used for stopping flow of blood. Is very astringent. Is used in leaking of the navel.

Morphine, Sulphate of.—A drug made from opium, having its actions, only much more powerful; not so constipating as opium, and so better to use to allay pain in colics; a convenient form to use hypodermically. *Dose*, by the mouth: Horse, 3 to 10 grains; cattle, 6 to 10 grains; sheep, ½ to 2 grains.

Mustard.—Used chiefly for plasters on various parts of the body of animals, as in severe cases of colic, or inflammation of the bowels; in diseases of the chest and throat, and over the loins in kidney affections. When mixed with warm water to a paste and applied to the skin, it blisters. For a plaster of ordinary strength for a thin-skinned horse, take ¼ pound of mustard, 2 tablespoonfuls of flour, and tepid water or vinegar to make a paste. In severe cases use only mustard and vinegar, or water. Apply by rubbing into the hair over part on which a blister is desired. A heaping teaspoonful in 4 to 6 ounces of warm water is an excellent emetic for swine and dogs.

Niter.—See Sweet Spirits of Niter.

Nitro-Hydrochloric Acid.—A mixture of Nitric and Hydrochloric Acids; it stimulates the secretions of the glands of the intestinal tract; very valuable in certain kinds of indigestion with torpidity of the liver. *Dose* of the medicinal acid: Horse, 1 to 2 drachms; cattle, 2 to 4 drachms; sheep, 20 to 40 drops; hogs, 10 to 20 drops; dogs, 3 to 10 drops.

Nux Vomica—(Powdered Seed.)—Is used in paralysis, and in weak, debilitated conditions. A great nerve tonic. Useful in condition powders. The active principle is strychnine, and when twitching of the muscles occurs the medicine should be stopped. Poisonous. *Dose:* Horse, ½ to 1 drachm; cattle, 2 drachms; sheep, 20 grains; swine, 10 grains.

Nux Vomica, Fluid Extract of.—Used after debilitating diseases with Gentian; also used in impactions, constipations, etc. *Dose:* Same as the powder.

Nitrate of Silver—(Lunar Caustic.)—A pencil form of Nitrate of Silver, used for cauterizing warts, growths, venomous bites, proud flesh, etc. Sticks must be kept in tightly-corked bottles to prevent dissolving. To use, simply wet and apply. A solution of 2 to 5 grains to the ounce of water is used for inflammation of the eye.

Nitrate of Potash—Saltpeter.—Chief action is on the blood and kidneys, causing the latter to secrete a large amount of urine. It reduces fevers and dropsical swellings. *Dose:* Horse, 1 to 4 drachms; cattle, ½ to 1 ounce; sheep, ½ to 1 drachm.

Oak-Bark Decoction, or Tea.—Good for diarrhea. Externally it dries up sores and toughens the skin. *Dose:* Colts and calves, 1 to 2 ounces; lambs, ½ ounce. Give in milk. Dose can be doubled, if necessary. To make: Boil 1 ounce of oak bark in 1 pint of water.

Oil of Tar.—Used chiefly in cases of chronic cough, and for such is an effectual remedy. *Dose:* For horse, 1 teaspoonful three times a day in feed, or on the tongue with a spoon.

Oil Male Shield Fern.—A most effectual remedy for worms, especially tapeworms. *Dose:* Horse, 3 to 4 drachms in a pint of raw Linseed Oil; cattle, same as horse; sheep and swine, 1 to 2 drachms in ½ pint Oil; dogs, ½ to 1 drachm in a half teacupful of new milk.

Olive Oil.—Laxative. *Dose:* Horse, 1 to 2 pints; cattle, 2 to 3 pints; sheep, 3 to 6 ounces. Externally it is used for healing and soothing irritated wounds; for this, may be used in the pure state or with Carbolic Acid—1 drachm of Acid to 4 ounces of Oil.

Opium.—The dried juice of the poppy; appears in the form of a gum, and a powder. It is used to allay pain; it stops the activity of the bowels, and so is not good to use in colic, but is very valuable in diarrhea. Laudanum, which is an alcoholic solution of Opium, is a convenient form in which to use the drug. *Dose* of Opium: Horse, ½ to 1 drachm; cattle, 1 to 2 drachms; sheep 5 to 20 grains; hogs, 3 to 10 grains.

Pepper, Black.—Used in a ground form to warm the stomach and bowels, and in this way relieve pain in colic, indigestion, etc. *Dose:* Horse, 1 tablespoonful; cattle, 1 tablespoonful; sheep and swine, 1 teaspoonful; dogs, ½ teaspoonful. If combined with Whiskey in a drench, it is excellent.

Peppermint, Essence.—Good in indigestion and colic. Give in sweetened water. *Dose:* Horse, 40 drops to 1 drachm; cattle, 1 to 2 drachms; sheep, 10 drops; dogs, 2 to 5 drops.

Pumpkin Seeds.—Vermifuge, and tapeworm remedy. *Dose:* Horse, 1 pint.

Quinine, Sulphate of.—Reduces fever, stimulates, and in small doses is a bitter tonic. *Dose:* Horse, ½ to 1 drachm; cattle, 2 to 4 drachms; sheep, ½ drachm; pigs, 10 grains; dogs, 1 to 5 grains.

Salol.—A drug made from Salicylic Acid and Carbolic Acid; very largely used for rheumatism. *Dose:* Horse, 1 to 3 drachms; cattle, 3 to 5 drachms; sheep, ½ to 1 drachm; hogs, 20 to 40 grains; dogs, 2 to 15 grains.

Salts.—See Epsom and Glauber's Salts.

Salt, Common.—Useful as food in small amounts. All animals should be given a little salt in food. A solution of 1 ounce salt in a pint of water is good as a wash for sores and wounds.

Saltpeter.—See Nitrate of Potash.

Soda, Bicarbonate of (Baking Soda).—Useful in indigestion. Give before feeding. *Dose:* Horse, 2 drachms to 1 ounce; cattle, ½ to 1½ ounces; sheep, 1 drachm to ½ ounce; swine, 2 drachms,. Wet with water is good to apply to stings of bees and other insects.

Spanish Fly (Cantharides).—Not given internally. Is used in making blisters for reducing enlargements, such as curbs, tumors, and thickenings, after wounds have healed. Is used in proportion of 1 to 3 drachms Cantharides to an ounce of lard or Vaseline, as the case may require. For cattle, the blisters may be made a little stronger than for the horse.

Strychnine.—A powerful drug, made from Nux Vomica; very poisonous; has the same action as Nux Vomica; is a powerful nerve tonic. *Dose:* Horse, 1 to 2 grains; cattle, 2 to 3 grains; sheep, ¼ to ½ grain; dogs, 1-60 to 1-30 grain. If the drug is used hypodermically, the dose is one-half the above.

Sugar of Lead (Acetate of Lead).—Is used externally to heal sores and wounds. As a plain lotion, dissolve 1 ounce in 1½ pints of water. Used in White Lotion (see PRESCRIPTIONS).

Sulphate of Copper—Blue Vitriol—Blue Stone.—Is an antiseptic astringent and a mild caustic. Internally, it is used for checking discharges, as nasal gleet or chronic catarrh, and leucorrhea. Externally, it is used to burn out proud flesh, by dusting it on, every two or three days, according to how much it burns. Is also used in solution of 1 ounce to a pint of water, or stronger, if necessary. *Dose* internally: Horse, ½ to 1 drachm; cattle, 1 drachm; sheep, 10 to 20 grains.

Sulphate of Zinc—White Vitriol.—Astringent and tonic. *Dose:* Horse, ½ drachm; cattle 1 to 2 drachms; sheep, 15 to 30 grains; Externally it is used in healing lotions, as White Lotion and eye washes. Externally it is also good to destroy proud flesh by dusting it on the part once in two or three days.

Sulphur.—When given internally, it acts on the blood, and also on the skin, helping to destroy parasites and germs. *Dose:* Horses and cattle, ½ ounce; sheep, 1 drachm; swine, 20 grains. An ointment made of:

Sulphur	1 ounce.
Lard	6 ounces.

Is good for lice. Sulphur is a fine disinfectant, by being burned in empty, closed rooms in an iron vessel. A larger dish containing water should hold the one with Sulphur to prevent fire.

Sweet Spirits of Niter—Spirits of Nitrous Ether.—In small doses it acts on kidneys and skin and reduces fever. In large doses it acts on the stomach and bowels, relieving pain and neutralizing gases. Good in different forms of indigestion and colic. *Dose:* Horse, 1 to 2 ounces; cattle 2 to 3 ounces; sheep, 3 to 6 drachms; swine and dogs, 1 to 2 drachms.

Tincture of Chloride of Iron—Muriate of Iron.—Is used as a tonic, to stop bleeding, and as an application or wash in sore mouth, sore throat, and skin diseases. *Dose:* Horse, ½ to 1 ounce; cattle, 1 ounce; sheep, ½ to 1 drachm; swine, 10 to 30 drops; dogs, 2 to 10 drops. As an application, use ½ ounce of the tincture to 8 ounces of water.

Liquid Chloride of Iron, Strong.—*Dose:* One-fourth as much as Tincture.

Turpentine—Spirits of Turpentine—Oil of Turpentine.—Good for colic, bloating, and intestinal worms. Also stimulates the kidneys. Give in oil, gruel, or milk. *Dose:* Horse, ½ to 1 ounce; cattle, 1 to 2 ounces; sheep, 1 to 3 drachms; swine, 1 drachm; dogs, 5 to 30 drops. Externally, it is an irritant, and is used in stimulating or blistering liniments. It is also added to Linseed Oil in the proportion of 2 ounces of Turpentine to 6 ounces of oil as a stimulating injection.

Vaseline.—Softens and soothes parts applied to. Is also much used as a base for ointments and blisters.

Vinegar.—Is used externally as a cooling, stimulating lotion. Can be used hot. Internally, in small doses, and diluted with water, it may be given for cooling fevers.

Whiskey.—See Alcohol.

Wood Alcohol—Methylated Spirit.—Is not used as an internal remedy. Externally, it is used in liniments.

THE STOCKMAN'S MEDICINE CASE.—The importance of the stockman keeping on hand a few medicines and preparations, will depend upon his distance from a veterinarian and a druggist. A few things should always be kept, however, as when they are wanted, they are wanted at once, and if not at hand, their use is often neglected. All medicines and preparations should be plainly labeled; should be kept in a dark, cool place; all liquid in well-corked bottles, powders in covered cans.

Two or more colic mixtures.
One pound of the digestive tonic.
One-fourth pound of Saltpeter.
One-half pound of Sulphate of Iron (Copperas).
Three to five pounds of Epsom Salts.
Two quarts of raw Linseed Oil.
Four ounces pure Carbolic Acid.
One quart of a 3 per cent. solution of Carbolic Acid, ready for use.
Two ounces of Lysol.
One-half pound or Acetate of Lead (Sugar of Lead).
One-half pound of Sulphate of Zinc.
One pint of White Lotion, ready for use.
One-half pint of Alcohol.
One-half pint of some good strong liniment (Modified White Liniment).
One-half pint of mild, soothing liniment.
One-half ounce of Fluid Extract of Aconite.
One ounce of Fluid Extract of Belladonna.
One ounce of Fluid Extract of Nux Vomica.
Four ounces of Laudanum.
One ounce of Monsel's solution for stopping bleeding.

The foregoing list will meet nearly all emergencies, and other things can be sent for if needed. In the list, where a preparation is mentioned, see under PRESCRIPTIONS.

PRESCRIPTIONS

Soothing Lotion.—

Fluid Extract of Belladonna	1 ounce.
Laudanum	1 ounce.
Tincture of Aconite	1 ounce.
Soap Liniment	5 ounces.

Mix. This liniment will relieve pain and soreness where there is much inflammation. Is also good for sprains, in connection with fomentations. Will not blister. A part of the soap liniment in the above lotion can be replaced by Witch Hazel.

White Lotion.—

Sugar of Lead	1 ounce.
Sulphate of Zinc	6 drachms.
Water	1 pint.

Shake well before using. This is extensively used for wounds, sores, scratches, summer sores, and fistulæ. It can be used three times a day.

Modified White Lotion.—

Sugar of Lead	1 ounce.
Sulphate of Zinc	6 drachms.
Carbolic Acid	½ ounce.
Water, to make	1 pint.

Shake. Uses, same as White Lotion, but as it contains Carbolic Acid, is antiseptic, and hence more effectual in many places.

White Liniment.—

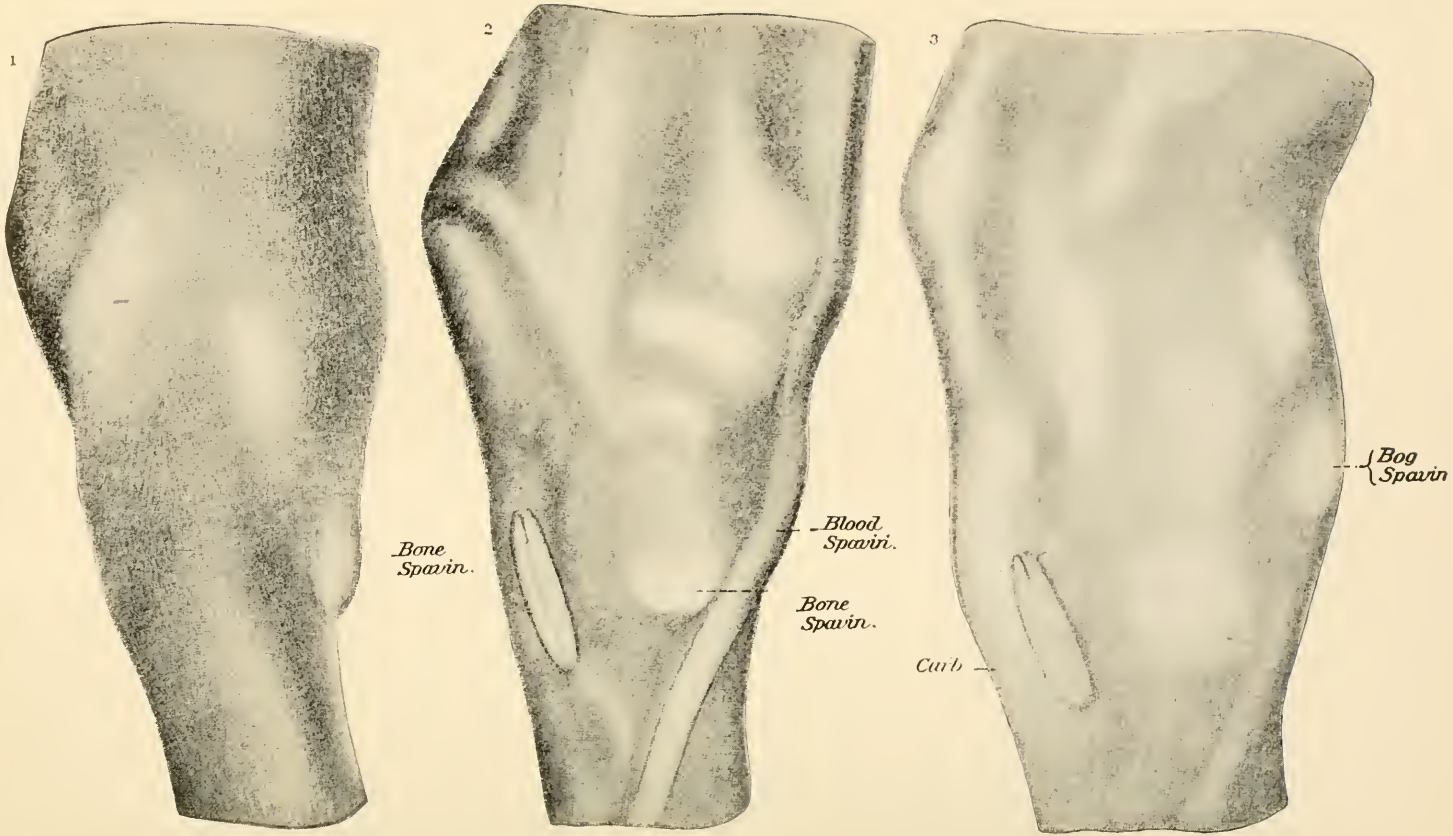
Aqua Ammonia	2 ounces.
Turpentine	2 ounces.
Linseed Oil	4 ounces.

Mix, and apply by rubbing. Bottle must be kept well corked. If a stronger liniment is wished, add more Ammonia and Turpentine; if a weaker is desired, add less Turpentine and Ammonia. This will blister if used freely and well rubbed in, especially, if part is covered to prevent evaporation.

Modified White Liniment.—

Aqua Ammonia (strong)	2 ounces
Turpentine	2 ounces.
Soap Liniment	4 ounces.

Shake. Action same as White Liniment; will not dirty parts so badly. Good for all sorts of strains, or wherever liniment is desired. Can make it weaker or stronger by changing the amount of Ammonia and Turpentine. An excellent liniment.



VARIOUS TYPES OF SPAVIN.

Acid Liniment.—

First put into a quart bottle, 2 ounces of Turpentine; then add to this, very slowly, ½ ounce of Sulphuric Acid, allowing it to run down on inside of bottle, which is turned partly on side. Take five minutes to add it. Then pour into bottle 2 ounces Wood Alcohol, adding slowly; add to this Cider Vinegar enough to make 1 quart; shake well, and it is ready for use.

This is a blistering liniment, and is effective in removing puffy enlargements, as bog spavin, wind-galls, thoroughpins and other puffy swellings around the legs. It is also good in sweeny, curbs, etc., where horse is needed for work. For rheumatism, rub affected joints every third day. This had better be put up by a druggist, as Sulphuric Acid is rather dangerous for the inexperienced to compound.

Cantharides, or Fly Blister.—

Powdered Cantharides	2 drachms.
Lard, or Vaseline	1 ounce.

Mix, and apply as directed in "Blistering" in HORSE DEPARTMENT page 258.

Red Mercurial Blister.—

Biniodide of Mercury	1 drachm.
Lard, or Vaseline	1 ounce.

Mix, and use as directed in "Blistering" in HORSE DEPARTMENT, page 258.

Combination Blister.—

Powdered Cantharides	2 drachms.
Biniodide of Mercury	1 drachm.
Lard, or Vaseline	2 ounces.

Mix, and use as above. Good for spavins, ring-bones, etc.

Drying and Healing Powder.—

Oxide of Zinc	2 ounces.
Calomel	2 ounces.
Boracic Acid	2 ounces.
Air-slaked Lime	2 ounces.

Mix. Dust on wound. Good for galls and sores where a dry dressing is desired. By adding Lard or Vaseline, it can be made into an ointment.

Carbolated Oil.—

Olive, or Sweet Oil	4 ounces.
Carbolic Acid	1 drachm.

Shake well together. An excellent remedy for healing wounds.

Carbolic Lotion (3 per cent.).—

Carbolic Acid	½ ounce.
Water	1 pint.

Mix. An excellent antiseptic wash for all kinds of wounds.

Creolin Lotion.—

Creolin	1 ounce.
Water	1 quart.

This makes an excellent healing lotion for wounds, and it also makes an excellent wash for destroying parasites, lice, or ticks on all animals.

1 to 1000 Corrosive Sublimate Solution.—

Corrosive Sublimate	15 grains.
Water	1 quart.

Shake. An excellent and cheap antiseptic for wounds; cannot be used on instruments.

Oxide of Zinc Ointment, Benzoated.—

Oxide of Zinc	1 ounce.
Benzoated lard	4 ounces.

Mix well together. This is an excellent healing ointment for dry, angry looking sores.

Iodine Ointment—Absorbing Ointment.—

Iodine Crystals	2 drachms.
Biniodide of Mercury	20 grains.
Iodide of Potash	1 drachm.
Lard, or Vaseline	2 ounces.

Mix. Apply twice a day until part is slightly sore, and then once a day, or once in two days, to keep it slightly irritated.

1. Eye Lotion.—

Sulphate of Zinc	½ drachm.
Fluid Extract Belladonna	½ ounce.
Water, to make	8 ounces.

Mix. Shake thoroughly, and it is ready for use. A good lotion for sore eyes, or for sores in the region of the eyes. Apply twice a day, after bathing the eyes with warm water or freshly-drawn milk.

2. Eye Lotion.—

Nitrate of Silver	5 grains.
Morphine Sulphate	5 grains.
Atropine Sulphate	2 grains.
Water, to make	2 ounces.

Shake. Drop 10 to 15 drops into the eye, three times a day with a medicine dropper. Keep in the dark.

1. Cough Mixture.—

Fluid Extract Belladonna	1 ounce.
Pulverized Opium	½ ounce.
Gum Camphor	1 ounce.
Ammonium Chloride	2 ounces.

Add molasses and flour, enough to make ½ pint of paste. With a small, wooden paddle daub a tablespoonful on the back teeth, three to five times a day.

2. Cough Mixture.—

Fluid Extract of Belladonna	2 ounces.
Ammonium Chloride	3 ounces.
Iodide of Potash	1 ounce.
Saltpeter	3 ounces.
Water, to make	1 quart.

Shake. *Dose:* 2 ounces, three times a day, in grain, or as a drench.

1. Colic Mixture.—

Laudanum	4 ounces.
Aromatic Spirits of Ammonia	3 ounces.
Sulphuric Ether	2 ounces.
Essence of Jamaica Ginger	4.ounces.
Water, to make	1 pint.

Give from 2 to 3 ounces of this in a half pint of hot water. A second dose can be given in one-half to one hour, and be repeated an hour later. Always dilute with hot water, but not hot enough to scald the animal

2. Colic Mixture.—

Aromatic Spirits of Ammonia	½ ounce.
Sulphuric Ether	½ ounce.
Fluid Extract Belladonna	1 drachm.
Fluid Extract Jaborandi	2 drachms.
Fluid Extract Calibar Bean	½ drachm.
Hyposulphite of Soda	2 ounces.
Water, to make	½ pint.

Shake. Give as one dose; repeat in one-half to one hour if necessary.

Physic Drench or Ball for Horses.—

Barbadoes Aloes	6 to 8 drachms.
Baking Soda	1 drachm.
Ginger	2 to 4 drachms.
Water (lukewarm) or thin Linseed meal gruel	1 pint.

Mix, and give as a drench, allowing horse to stand in the stable a day after giving it. A good purgative to clear the bowels. Or, by mixing with molasses to make a stiff dough, may be given as a ball.

Physic Drench for Cattle.—

Epsom Salts	1 to 1½ pounds.
Ginger	1 ounce.
Syrup	4 ounces.
Water, to make	2 quarts.

Mix, and give as one dose.

Cough Mixture for Cattle.—

Gum Camphor	2 drachms.
Saltpeter	3 drachms.
Spirits of Niter	1 ounce.
Water or Gruel	1 pint.

Mix, by dissolving Camphor in the Spirits of Niter, and add the water (or gruel) and Saltpeter, and give as one dose. May be repeated two or three times a day.

General Condition Powders.—

Gentian Powder	½ pound.
Cooking Soda	½ pound.
Nux Vomica, powder	¼ pound.
Arsenic	1 drachm.

Mix. *Dose:* Tablespoon level full morning and night in moistened grain. At noon give the following:

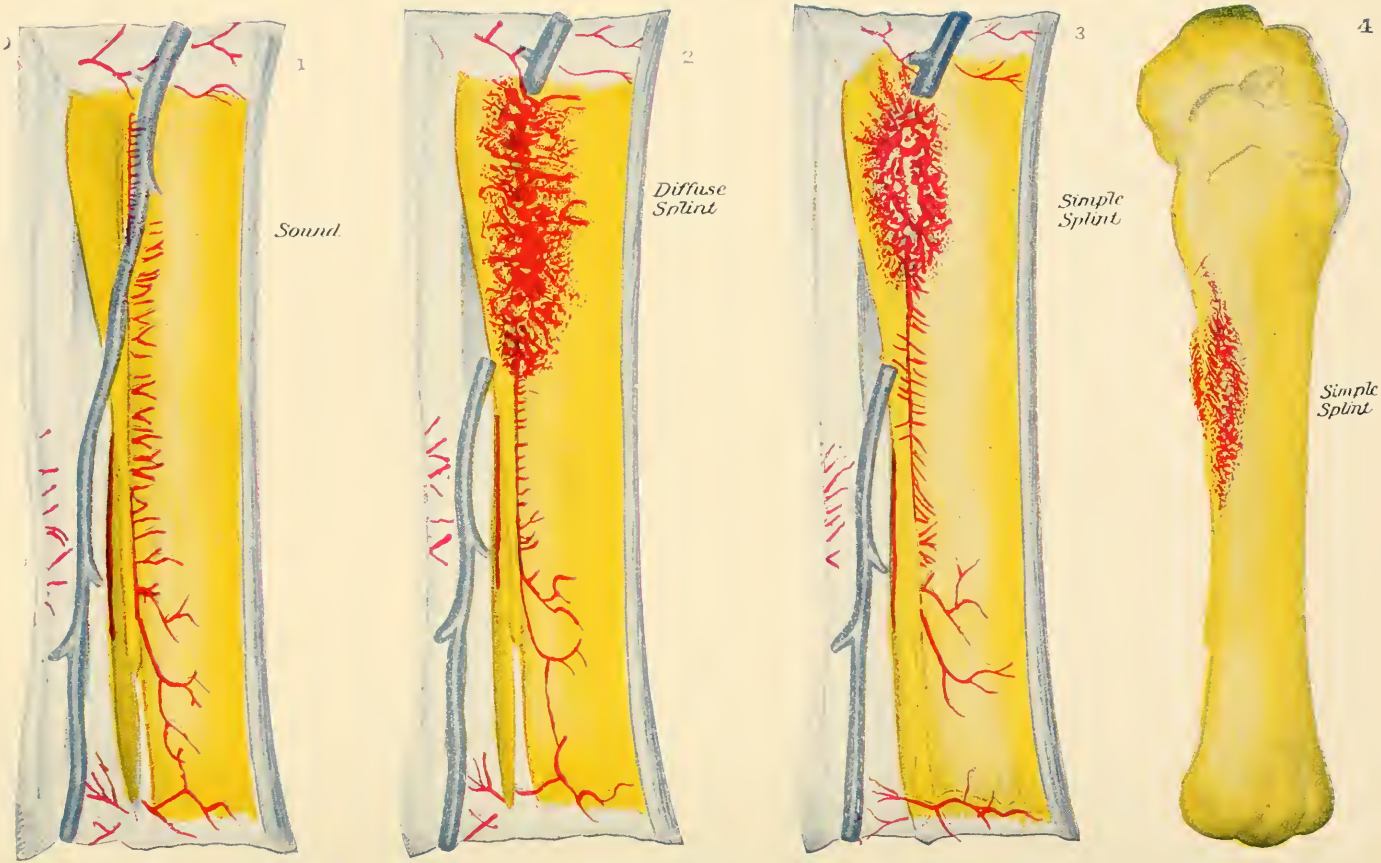
Sulphate of Iron	4 ounces.
Saltpeter	4 ounces.

Mix. *Dose:* Tablespoon level full.

Hoof Ointment.—

Raw Linseed Oil	4 ounces.
Crude Petroleum	4 ounces.
Neatsfoot Oil	4 ounces.
Pine Tar	4 ounces.

Mix well, and apply every night with a brush, all over and under the hoof—even a little in the hair above the hoof. Clean out hoof before applying.



SPLINT.

PRACTICAL REMEDIES AND RECIPES

...FROM PRACTICAL...

FARMERS AND STOCK OWNERS

THE aim has been to make this book one of great value from a *practical* as well as from a *scientific* standpoint. Every successful farmer has a few favorite remedies that he has tried and tested and that he knows to be valuable. To gather these remedies has been a long and difficult undertaking, but we have succeeded, and it is believed that the following, gathered from all sections of the country and from the most reliable sources, will be found the most valuable collection of sure and simple remedies ever gathered for the home use of the farmer and stock owner.

PUBLISHERS

REMEDIES FOR HORSES

TO KEEP HORSES IN HEALTH.—Give leaf tobacco finely pulverized, one tablespoonful once a week in wheat bran; colts, one teaspoonful once a week.

Robert E. Chambers, Spencer, Indiana, R. F. D. 1.

BLOATING.—If bloated from wind, give injection of warm soapy water; if animal shows signs of inflammation, give about 30 drops of Tincture of Aconite.

John Oatway, Green Ridge, Manitoba, Canada.

BLOOD PURIFIER.—

Sulphur	2	ounces.
Cream of Tartar	2	"
Sassafras	2	"
Mandrake, powder of	2	"

Mix and give one tablespoonful once a day in grain.

Walter Whitfield, Sr., Pontiac, Michigan, R. F. D. 6.

BOG-SPAVIN AND THOROUGH-PIN.—Keep the horse as quiet as possible in a box-stall and blister once every month as long as necessary with the following:

Biniodide of Mercury.....1½ drachms.
Cantharides.....1½ "
Vaseline ..... 2 ounces.

Mix well together.

Clip all the hair off and rub the blister (the above ointment) well in. Be sure to tie him up so that he cannot bite the parts. In twenty-four hours rub well again, and in twenty-four hours longer wash off and apply sweet oil every day. It is sometimes necessary to blister several times to effect a thorough cure.

J. Kearns, Palmerston, Ontario, Canada.

BOTS.—Drench with 1 pint of Indigo water reasonably strong. *I. S. Harper, Novelty, Missouri.*

BOWELS, INFLAMMATION OF THE.—I treat about the same as in colic. I always employ the best veterinarian I can, when I have a case of this kind, and they often fail to do much. My experience is that much can be accomplished by treating the same as colic, and applying lots of heat to the body in the form of woolen blankets wrung out in hot water, and held up to the belly; also heat the back if you do not use the blanket and hot water. Have found it good to use:

Spirits of Turpentine..... 1 ounce.
Mustard..... ½ pound.
Vinegar ..... ½ gallon.

Mix together and rub on the belly and strap a blanket on the horse; also apply some on the back of the animal.

I am a farmer 60 years of age and have farmed all my life. Have used all the recipes I am sending you, for over 35 years, and found them to be of great success with my own stock, as well as to the neighborhood in which I live. I believe I could sell a number of your books here, as the farmers around would like to get hold of some of the recipes I am sending you.

The recipes I am sending you are intended for animals that have come to maturity, and should be reduced according to the age and strength of the animal.

I wish you success with your book.

George Campbell, Gilchrist, Simcoe Co., Ontario.

BREAST BRUISED FROM EATING OUT OF A HIGH MANGER.—Put in a rowel made of leather or silk thread. Keep moving it every day until it is running well, then remove the string and keep sore washed well with warm water.

I. P. Woodard, New Comerstown, Ohio.

CASTRATION, BLEEDING FROM.—Rub back with salt water and apply vinegar to sore.

Almer L. Maland, Rushford, Minnesota.

CATARRH IN THE HEAD, OR THE HEAVES.—Feed western prairie hay. This hay has plenty of resin plant in it.

D. F. Pike, Lisbon, Ohio.

COLIC.—Sulphuric Ether, given in 1 ounce doses, mixed with twice the quantity of warm water or milk—dose repeated in 15 minutes if not easier—will positively cure any case of acute or spasmodic colic. This remedy will also cure colic in any animal or human, and will positively cure the so-called "Lamb Cholera" in young lambs if discovered before they are too far gone. "Lamb Cholera" is nothing but colic produced by sickness or changes in the dam's milk.

Geo. M. Wilber, Marysville, Ohio.

2. **Colic.**—Have found whiskey and soda the safest remedy. Give 1 pint whiskey and a tablespoonful of soda mixed. Repeat the dose if not relieved in thirty minutes.

W. A. Langford, Richmond, Kentucky.

3. **Colic.**—Take 1½ pints of lard, heat quite warm, place in a bottle and drench the horse with it. This can be used when other remedies cannot be had.

Gurley Taylor, Boonville, Indiana.

4. **Colic.**—20 drops Wild Yam in ½ pint warm water every fifteen to thirty minutes will cure colic.

W. I. Reynolds, Pipestone, Minnesota.

5. **Colic.**—Make 1 quart of strong hop tea, drench the horse, then move him briskly for half quarter and back.

My remedies for Bots and Colic I got from my father, who was a veterinary. I never knew him to lose a horse, and he traveled all over this country.

I. S. Harper, Novelty, Missouri.

6. **Colic.**—In early stage.

Aqua Ammonia..... 1 teaspoonful.
Sweet Milk..... 1 pint.

Shake well and give in one dose.

7. **Colic.**—

Spirits of Turpentine..... 1 ounce.
Laudanum..... 2 ounces.
Warm Water..... 1 pint.

Mix and give in one dose.

Colic is about the only thing that ever ails my horses, and if I fail to have the above on hand, I give ¼ pound of common baking soda in a quart of water and repeat in half an hour if necessary. This has never failed me yet.

W. A. Eastwood, Chesaning, Michigan, R. F. D. 2.

8. **Colic.**—A horse's stomach holds but four quarts. If watered after feeding it will force all feed into the large intestines, where it will ferment and cause colic.

Laudanum.
Sulphuric Ether.
Spirits of Nitre—equal parts of each.

Give 2 tablespoonfuls every half hour in pint of water.

Jacob Shearley, Franklin, Pennsylvania.

9. **Colic.**—Give one heaping tablespoonful of soda in one quart of buttermilk. Put the soda into the buttermilk just when ready to give. Repeat in half an hour, if necessary.

Robert E. Chambers, Spencer, Indiana, R. F. D. 1.

10. **Colic or Pain Cure.**—

Laudanum	1 ounce.
Spirits of Camphor	1 "
Tincture of Rhubarb	1 "
Oil of Peppermint	2 drachms.
Oil of Cinnamon	2 "

Dose for a horse, 30 to 40 drops in ½ pint warm water.

Excellent for persons also, given, of course, in smaller doses.

D. H. Clifton, DeCliff, Ohio.

11. **Colic.**—Pour one teaspoonful of Turpentine on spine, then insert an onion up the rectum, then let him inhale the Turpentine. This will cause a passage. If not, move him about.

J. P. Woodard, New Comerstown, Ohio.

12. **Colic.**—One-half cupful of Spirits of Turpentine in one quart of warm water, given as a drench.

Isaac Salkeld, Goderich, Ontario, Canada.

13. **No. 1.—For Colic.**—

Sweet Spirits of Nitre	1½ ounces.
Tincture of Opium	1 ounce.
Extract of Ginger	½ "
Water	½ pint.

Mix and give as one dose.

14. **No. 2.—For Wind Colic.**—

Chloroform	½ ounce.
Linseed Oil, raw	1 quart.

Mix and give as one dose.

Wm. A. Hale, Anamosa, Iowa.

15. **Colic.**—

Wormwood, Oil of	¼ ounce.
Origanum, Oil of	½ "
Laudanum	¼ "
Gum Camphor	¼ "
Capsicum, pulverized	½ "
Alcohol	½ pint.

Dose.—For a horse, one tablespoonful in one-half teacupful of lukewarm water. Repeat in half an hour.

Walter Whitfield, Sr., Pontiac, Michigan, R. F. D. 6.

16. Colic.—

Chamomile Tea (warm) ..... 1 pint.
Spirits of Nitre ..... 1 ounce.
Saleratus (or Soda)... ..... 1 "

Mix and give to horse out of long-necked bottle, as one dose. Rub horse's flanks and small-of-back and keep fairly warm with a blanket.

Ernest Heine, Ellendale, North Dakota.

17. Colic.—

Chloroform ..... 1 teaspoonful.
Cayenne Pepper ..... 1 "
Ginger ..... 1 tablespoonful.

Give in one pint warm water, then follow in fifteen minutes with from one to one-half pints raw Linseed Oil.

The above, so far as I have tried or have seen tried, has proved entirely successful.

H. M. Hance, Shepherd, Michigan.

COLIC, CRAMP.—

Sulphuric Ether ..... 2 ounces.
Laudanum ..... 2 "

Give in ½ pint Linseed Oil raw.

G. D. Foster, Kingfisher, Oklahoma.

COLIC, SPASMODIC.—

Tincture of Asafetida ..... 4 ounces.
Sulphuric Ether ..... 1½ ounce.

Mix, and give ¼ of contents in 1 pint of warm water every ten minutes until relief.

Gilbert Holmes, Hillsboro, Ohio, R. F. D. 6.

2. Colic, Spasmodic.—

Sweet Spirits of Nitre ..... 1½ ounce.
Tincture of Opium ..... 1 ounce.
Extract of Ginger ..... ½ "
Water ..... ½ pint.

Mix and give as one dose. When possible, give warm water injections.

Have used this remedy for twenty-five years with very good results in nearly every case.

John Gawthrop, Milford, Indiana.

3. Colic, Spasmodic.—My favorite remedy for this is:

Sweet Spirits of Nitre	1 ounce.
Tincture Laudanum	1 "
Ginger	1 tablespoonful.
Common Soda	1 "
Lukewarm Water	1 pint.

Mix and give as one dose. Repeat every four hours until better. In bad cases apply hot cloths to the belly.

George Campbell, Gilchrist, Simcoe Co., Ontario.

COLIC, WIND OR FLATULENT.—I treat the same as in Spasmodic Colic, given over my name, only I give an occasional drench of:

Common Soda	3 tablespoonfuls.
Ginger	1 tablespoonful.

This is to take the wind away.

George Campbell, Gilchrist, Simcoe Co., Ontario.

COLLAR GALLS.—

Vaseline	4 ounces.
Tannin	2 drachms.

Apply morning and evening.

Almer L. Maland, Rushford, Minnesota.

COLLAR, SCALD UNDER.—Bathe in cold water.

W. S. Starcher, Berlin, Wisconsin.

CONDITION, TO.—When a horse is sick and does not eat well, feed him a hot mash and some apples.

J. P. Woodard, New Comerstown, Ohio.

CONDITION POWDER.—The following is a recipe which I know to be very good, in fact, the best I ever used, and I have used quite a number of the different powders.

Ginger	6 ounces.
Elecampane	6 "
Juniper Berries	4 "
Fenugreek	6 "
Epsom Salts	4 "
Gentian Root	4 "
Tartar Emetic	2 "

Powder all well together and give one tablespoonful in soft feed twice a day.

Valentine Thoeny, Tell, Buffalo County, Wisconsin.

2. Condition Powder.—

Rosin	1 part.
Sulphur	1 "
Ginger	1 "
Saltpeter	1 "
Cream of Tartar	1 "
Copperas	1 "
Poplar Bark	1 "
Fenugreek	1 "
Blood Root	1 "
Buchu	1 "
Senna	1 "

Pulverize and mix. Dose, 1 tablespoonful in feed or bran mash.

I have used this condition powder for thirty-five years and have found it the best thing ever tried for conditioning horses. It cleanses the stomach and bowels, removes worms and purifies the blood. It is highly praised by liverymen who have used it.

J. F. R. Holmes, Hillsboro, Ohio, R. F. D. 3.

3. Condition Powder.—For horses that are run down and do not thrive. First, examine the teeth.

Fenugreek, Cream of Tartar, Gentian, Sulphur, Saltpetre, Rosin, Black Antimony and Ginger, equal parts; Cayenne Pepper, one-half part. Thoroughly mix and give one tablespoonful in bran once a day.

J. W. Higgs, Silver Leaf, North Dakota.

COUGH.—If a horse has a cough following distemper, or any disease of the respiratory organs, or in heaves, give the following:

Oil Tar	4 ounces.
Oil Amber	4 "
Coal Oil (Kerosine)	4 "
Spirits of Turpentine	4 "

Mix Oil Tar and Oil Amber in one bottle and the Coal Oil and Turpentine in another. To give: Put one tablespoonful of the latter in the drench bottle, and shake so the Tar and Amber Oils will not stick; then add one tablespoonful of the Oils of Tar and Amber. Shake and give as a drench, repeating every night after feeding until the cough stops.

Also give a teacupful of Raw Linseed Oil every morning. This will cure heaves or any other cough if properly used. It is the best throat and lung medicine in use.

George Campbell, Gilchrist, Simcoe Co., Ontario.

CUTS.—For cuts of any kind apply Turpentine as soon as possible, then follow with liberal applications of Sweet Oil.

H. M. Hance, Shepherd, Michigan.

CUTS AND WOUNDS.—

Linseed Oil	8 ounces.
Carbolic Acid	1 ounce.
Iodoform	1 drachm.
Oxide of Zinc	1 "

Mix thoroughly and apply twice a day.

Bartley Jost, Alma, Wisconsin.

FRESH CUTS, SALVE FOR—CALLED "BISHOP'S SALVE."—

Red Lead	1 pound.
Linseed Oil	1 pint.

Boil together. Care must be taken in boiling or it will burn or get too hard to use.

D. H. Clifton, De Cliff, Ohio.

CRACKED HEELS, SCRATCHES, OLD SORES, OPEN JOINT.—Is excellent for all enumerated, and will stop the oil from running out of the joints.

Sugar of Lead	1 tablespoonful.
Alum	1 "
Bluestone (Sulphate of Copper)	1 "
Best Vinegar	1 teacupful

Mix. For fresh wounds add more vinegar.

I paid $5.00 for this recipe and it is the best money I ever invested. If a horse gets kicked on the stifle joint, bathe with hot water with a little salt in it. Have water as hot as your hand will bear, and continue applying for twenty minutes. Wipe dry and apply the above liniment freely. Have saved many a good horse with this liniment. I never poultice a horse when kicked on the stifle joint; think it is a great mistake to do so. If you have to use a syringe with this liniment use a glass one, as it will spoil any other kind.

George Campbell, Gilchrist, Simcoe Co., Ontario.

DIARRHOEA IN YOUNG FOALS.—In mild cases give the following:

Flour	2 tablespoonfuls.
Cold Water	1 teacupful.

Mix and drench twice a day.

If the colt is in pain give the following:

Tincture laudanum	10 to 15 drops.
Castor Oil	1 ounce.
Whiskey or Brandy	2 tablespoonfuls.

Mix and drench. Also apply mustard plaster—mustard and flour in equal parts—to the belly, and keep the colt warm.

George Campbell, Gilchrist, Simcoe Co., Ontario.

DISTEMPER, OR STRANGLES.—

Resin	1 pound.
Alum	1 "
Ginger	1 "
Blue Vitriol	½ "

Powder, mix all together and give 1 tablespoonful twice per day in feed.

I never knew it to fail. Had nine head of my own with it one fall and they got along finely under this treatment.

John D. Allen, Worthington, Indiana.

2. **Distemper.**—Keep bowels open with ½ pint Castor Oil and ½ pint Salts dissolved in warm water. Give warm. If the throat is badly swollen, take 1 gallon shelled oats, pour boiling water on them, and when cool enough put them in a sack and bind under jaw and throat. Rub the throat with the following liniment:

Olive Oil	4 ounces.
Spirits of Turpentine	1 ounce.
Spirits of Camphor	1 "
Aqua Ammonia	1½ ounces.

This liniment is good for sprains, bruises, sore shoulders, stiff joints and pains generally, in man or beast.

Robert E. Chambers, Spencer, Indiana, R. F. D. 1.

3. Distemper.—

Common Black Gunpowder...	1	tablespoonful.
Lard	1	"
Soapsuds (stiff)	1	"
Pine Tar	2	tablespoonfuls.
Gum Myrrh	1	tablespoonful.

Mix and put one teaspoonful of the mixture on horse's tongue twice a day.

Bathe throat with Tobacco tea, as follows: To one quart of water add one ounce of cheap Tobacco and let water boil up. Apply as hot as horse can bear it.

Ernest Heine, Ellendale, North Dakota.

4. Distemper.—In bad cases of distemper in horses or mules I use Linseed Oil. Pour one tablespoonful into each ear.

I. M. Hume, Williamstown, Kentucky.

5. Distemper, or Strangles, A Good Remedy for.—Will prevent gathering or breaking if used at the outset.

Spanish Flies (powdered)	1	ounce.
White Wine Vinegar	1	gallon.

Mix. Clip off the hair from the throat and apply the remedy twice a day. Do not let the mixture freeze. Keep in a warm place in the winter.

This is also a good remedy for laryngitis or inflammation of the throat, and should be applied in the same way as for distemper. For internal use take:

Saltpeter	¼	pound
Chlorate of Potash	¼	"

Mix and give one teaspoonful on the tongue three times a day.

George Campbell, Gilchrist, Simcoe Co., Ontario.

6. Distemper, or Strangles, Bastard.—For this disease I mix mustard and cayenne pepper in equal parts with water to a thin paste and apply to the throat and windpipe, down on the chest, and also apply some to the abscesses to bring them "to a head." When ready to open, lance abcesses on the lower part, to favor escape of matter, and press it out.

George Campbell, Gilchrist, Simcoe Co., Ontario.

EYES, INFLAMMATION OF THE.—Use Extract of Witch Hazel freely to bathe the eyes. Very good.

Almer L. Maland, Rushford, Minnesota.

2. Eyes, Inflammation of.—

Sulphate of Zinc	1 drachm.
Carbolic Acid	½ "
Glycerine	1 ounce.
Water	4 ounces.

Get this lotion prepared by a druggist and put four or five drops into the affected eyes morning and evening.

Walter Whitfield, Sr., Pontiac, Michigan, R. F. D. 6.

FARCY.—

Nitrate of Potash, powdered finely.	4 ounces.
Black Antimony	2 "
Sulphite of Soda, powdered	1 ounce.
Elecampane, powdered	2 ounces.

Mix and give 1 tablespoonful once or twice a day.

This remedy I have tried a good many times in the last thirty years and it has never failed to do the desired work.

Tilman Wilkin, Spencerville, Ohio.

2. Farcy.—Or swelling along the abdomen caused by indigestion from heavy feeding and run down condition.

Saltpeter	3 ounces.
Sulphur	3 "
Cream of Tartar	3 "
Anise Seed	3 "

Mix and divide into four powders. Give one powder in feed the first meal, one the second, miss the third, give the fourth, miss the fifth and give the sixth. Better to be given in soft feed. A sure cure.

John Oatway, Green Ridge, Manitoba, Canada.

FISTULA, OR POLL EVIL.—

Alcohol	6 ounces.
Oil of Spike	2 "
Oil of Sassafras	2 "
Camphor Gum	4 "
Ox or Beef Gall	2 "
Oil of Tansy	2 "

Apply once per day before pus has formed. It is a sure cure.

John D. Allen, Worthington, Indiana.

FOUNDER.—The following receipt is a sure and speedy remedy: Take a tablespoonful of pulverized Alum, pull the horse's tongue out of his mouth as far as possible and throw the Alum down his throat. Let go of his tongue and hold up his head until he swallows. In six hours time, no matter how bad the founder, he will be fit for moderate service. I have seen this remedy tested so often with perfect success that I would not make five dollars difference in a horse foundered (if done recently) and one that was not.

Gilbert Holmes, Hillsboro, Ohio, R. F. D. 6.

2. Founder.—Founder is produced by three different causes: over-feeding, watering when too warm, or by driving a horse until he is very warm and letting him stand in a cold, raw wind without blanket. The last case is very severe and is difficult to cure.

For Founder of short standing, take the small blade of a pen-knife, one-half inch from the point, and bleed in the wart of the feltlock of each fore leg, taking one teaspoonful of blood from each, and cause him to swallow a teaspoonful of dry Alum. If he has been foundered for any length of time, treat as above and bathe the legs thoroughly with the following:

Beef's Gall, fluid contents of.....	6	ounces.
Alcohol	6	"
Ammonia, Spirits of	3	"

Shake well and bathe twice a day.

F. E. Battle, Falls, Texas.

3. Founder.—A good remedy if the trouble is caused by too much grain. Keep the animal from water for twelve hours. As soon as you can, draw one gallon of blood from the horse's neck, then drench with one quart Linseed Oil and rub the fore legs long and well with very hot water.

J. W. Higgs, Silver Leaf, North Dakota.

4. Founder, From Grain.—Drench with one pint Linseed Oil. Stand his front feet in a tub of hot water. In one hour, if he has not had a passage, repeat the dose. Give him exercise and some water.

J. P. Woodard, New Comerstown, Ohio.

5. **Founder, To Prevent.**—For a horse that has been overfed grain, if taken immediately, give one tablespoonful of powdered Alum by drawing out tongue, placing thereon and letting go at once. Follow with 1¼ quarts raw Linseed Oil. Bleeding in feet will also help if the person is competent to use the knife.

Wm. A. Hale, Anamosa, Iowa.

FROST'S CELEBRATED BLACK OIL FOR MAN OR BEAST.—

Neat's Foot Oil	1 pint.
Spirits of Turpentine	1 "
Oil of Spike	2 ounces.
Oil of Origanum	2 "
Oil of Vitriol	1 ounce.

This liniment *must* be properly mixed to be of value, as follows: Secure a half gallon jug, put the first four ingredients in and stir them thoroughly together, after which add a *little* of the Vitriol and continue stirring for a few minutes, then add a little more Vitriol and repeat the stirring, continuing this until the Vitriol is all used. *It requires about two hours* to get the Vitriol in without burning the liniment. Then let the whole mixture stand a few hours and it is ready for use.

This liniment should be applied externally and is the best and cheapest all-around stock liniment I ever saw. It is especially valuable for cuts, bruises, rheumatism and stiff joints. It is strong enough to kill bone spavin, and will not produce any more sensation in a fresh cut than so much water *if it is properly mixed.* If it is not properly mixed, it produces a burning sensation and is valueless. If used on animals, it should be washed out of the hair every other day as it may cause the hair to slip; otherwise it will not do any damage. It is the best wire-cut remedy I ever saw as it leaves the least scars.

This recipe has been in use in our family for fifty years and is the most valued one we have.

L. L. Frost, Mirabile, Missouri.

GALLS ON HORSES.—White Lead moistened with Sweet Oil or sweet milk. Cover the galled spots twice a day. Wash before each application.

J. P. Woodard, New Comerstown, Ohio.

GREASE HEEL.—Give Sulphite of Soda, ½ ounce three times per day, and also give Cantharides, 5 grains once per day.

Joseph H. Reed, Canonsburg, Pennsylvania, R. F. D. 38.

2. Grease Heel, Scratches and Old Sores, Good Liniment For.—

Linseed Oil	1 quart.
Turpentine	½ pint.
Oil of Vitriol	2 ounces.

Put the Linseed Oil and Turpentine into a glass jar or earthern vessel and *drop the Vitriol in slowly*, stirring until cool.

Joseph H. Reed, Canonsburg, Pennsylvania, R. F. D. 38.

Grease Leg.—Prepare horse for physic by giving bran mash diet for twenty-four hours, then give the following:

Barbadoes Aloes	6 drachms.
Ginger, ground	2 "
Oil, raw	1 pint.

Next dissolve two ounces of Saltpeter, put into one-half pail of cold water and bathe the leg thoroughly for thirty minutes; then spread a poultice of boiled flaxseed on a cloth large enough to cover leg from back to fetlock, sprinkle poultice freely with Carbolic Acid, place poultice on leg and bandage well with flannel to retain heat. Renew poultice on leg several times for a couple of days until grease is well drawn out or scab is formed on leg, then remove poultice and wash leg regularly with the following:

Wa er, soft	½ pailful.
Creolin	2 tablespoonfuls.

Also use Castile soap and continue the washings until all scurf is removed. Keep leg bandaged while operating, gradually changing to lighter bandages until finished.

The above is a sure cure for grease or swelled leg. I have used it on several of my own horses during the past ten or fifteen years and have given it to many of my neighbors, and have never known it to fail when taken in the early stage of the disease and properly and carefully applied. I first got the remedy from a clergyman from the Highlands of Scotland.

J. D. Baskerville, Dominion City, Manitoba, Canada.

Grease, Ointment For.—

Honey	½ pound.
Lard	½ "
Tar	½ "
White Vitriol	1 ounce.
Sugar of Lead	1 "
Alum	¾ pound.

Melt together the first three ingredients, pulverize the balance and mix in by stirring until cold. Put on lint cloth, bind on and keep on for 40 hours. Repeat as needed. Give purifying powders.

I have tried and seen the above tried in several cases and never knew it to fail. This receipt is worth as much as the horse, for it will cure the grease, and a horse with grease heel is worthless.

A. B. Dickerson, Lakeview, Michigan.

HEAVES.—I have known horses to have the heaves so bad that they were entirely useless, and cured them completely by feeding nothing but ear corn for six to eight months.

S. W. Powell, Polo, Illinois.

2. Heaves, or Broken Wind.—Give eight or ten drops Tincture of Phosphorus in the drink several times a day for eight or ten days.

Bartley Jost, Alma, Wisconsin.

HOOF BOUND.—The following receipt I know by experience to be *very good:*

Beeswax	2 ounces.
Venetian Turpentine	2 "
Burgundy Pitch	2 "
Rosin	2 "
Olive Oil	3 "
Pine Tar	4 "
Dissolve and add Spirits of Turpentine	2 "

Rub well on hoof affected once every day for eight or ten days, and in severe cases repeat the treatment after an elapse of one week.

Valentine Thoeny, Tell, Buffalo County, Wisconsin.

HOOF OINTMENT.—

Archangel Tar	1 pound.
Tallow	½ "
Beeswax	4 ounces.

Melt together and apply twice a day.

Bartley Jost, Alma, Wisconsin.

2. **Hoof Ointment.**—For crack in hoof or to grow on a new hoof.

Muriatic Acid	1 ounce.
Butter of Antimony	1 "
White Vitriol, pulverized	1 "

Mix and apply to parts.

John Oatway, Green Ridge, Manitoba, Canada.

INDIGESTION, ACUTE.—One quart raw Linseed Oil. Use as a drench and repeat if not relieved soon.

W. R. Sedberry, Pittsfield, Illinois.

2. **Indigestion, Acute.**—First mix and give the following:

Common Soda	4 tablespoonfuls.
Ginger	1 tablespoonful.

This will neutralize the gas in the stomach. In ½ hour after I give the following:

Spirits of Turpentine	1 ounce.
Tincture Laudanum	1 "
Raw Linseed Oil	1 pint.

Mix and give as a drench, and repeat every four hours until better. Apply to the stomach hot cloths as directed in congestion of the lungs over my name.

I treat chronic indigestion the same as acute indigestion, only I use more Ginger and Soda, or ground Gentian Root.

George Campbell, Gilchrist, Simcoe Co., Ontario.

LICE.—Insect Powder dusted over a horse well, then blanketed for an hour, will kill lice. Repeat in one week.

Elmer C. Wood, Mt. Gilead, Ohio.

LINIMENT FOR SPRAINS, BRUISES, ETC.—

Liquor Ammonia	1 ounce.
Tincture of Arnica	1 "
Tincture of Opium	1 "
Oil of Turpentine	1 "
Alcohol	1 "
Water, add to make	1 pint.

Bathe two or three times daily, rubbing in well with the hand.

This is a splendid remedy for sprains or bruises, good for man or beast. One of my neighbors had a very sore foot which he cured with this remedy. Have used this liniment continuously for thirty years.

John Gawthrop, Milford, Indiana.

2. **Liniment.**—

Oil of Spike	2 ounces.
Origanum	2 "
Hemlock	2 "
Wormwood	2 "
Sweet Oil	4 "
Spirits of Ammonia	2 "
Gum Camphor	2 "
Spirits of Turpentine	2 "
Alcohol (strong)	1 quart.

Mix well together and bottle tight.

An unequaled horse liniment, and one of the best ever made for human ailments, such as rheumatism, sprains, etc.

Gurley Taylor, Boonville, Indiana.

3. **Liniment, Clifton's.**—

Spirits of Ammonia	1 ounce.
Spirits of Camphor	2 ounces.
Turpentine	2 "
Sweet Oil	1 ounce.
Gasoline, sufficient to make	1 pint.

Keep away from the fire when applying it.

D. H. Clifton, De Cliff, Ohio.

4. **Liniment.**—My favorite, and an excellent one for lumps, cuts, bruises, etc.

Turpentine	4 ounces.
Linseed Oil	4 "
Oil of Spike	4 "
Gum of Camphor	2 '

Rub on as often as the case seems to require.

James M. Ross, Fairmount, West Virginia, R. F. D. 3.

5. **Liniment for Sprains, Bruises, Sores, Lameness, Etc.**—This liniment has been thoroughly tested for years, and no one will be disappointed in using it.

Olive Oil	4 ounces.
Turpentine	4 "
Gum Camphor	5 cents worth.

Charles E. Haynes, Hillsboro, Ohio.

6. **Liniment.**—

Whiskey	6	ounces.
Turpentine	2	"
Spirits of Camphor	2	"
Spirits of Soap	2	"

Apply three times a day.

Bartley Jost, Alma, Wisconsin.

7. **Liniment, Good for Man or Beast.**— Mix 2 ounces Spirits of Turpentine with ½ pint hard water and shake thoroughly for five minutes. Add one hen's egg well beaten and shake again for five minutes. Put in 2 ounces Methylated Spirits of Alcohol (wood alcohol) and shake five minutes; add 2 ounces strong Liquor of Ammonia and shake five minutes. Add hard water enough to make up a quart and shake again thoroughly and the liniment is ready for use. This is a great and effectual remedy for all kinds of sprains and bruises when the skin is not broken.

L. D. Arnold, Bergen, New York.

LOCKJAW, CURE FOR.—Bleed the horse in the third bar of the mouth and drench with strong, salt water.

J. P. Woodard, New Comerstown, Ohio.

LUNGS, CONGESTION OF THE.—Give the following:

Sweet Spirits of Nitre	1	ounce.
Laudanum	½	"
Cold Water	1	pint.

Mix and give as a drench in one dose, repeating every two to three hours. If the horse is in high condition, add to the above 10 to 15 drops of Fleming's Tincture of Aconite.

Apply hot cloths to the chest, that are wrung out from the following:

Mustard	2	ounces.
Spirits of Turpentine	3	"
Hot Water	½	pailful.

If the horse has a cough afterward give him the remedy for cough, to which my name is signed.

George Campbell, Gilchrist, Simcoe Co., Ontario.

MANGE.—

No. 1.—Carbolic Acid	1	ounce.
Sulphur	¼	"
Water	1	pint.
No. 2.—Sulphur	½	pound.
Lard	1	"
Olive Oil	1	ounce.

Wash with tar soap and warm water and apply No. 1; the next day apply No. 2; the third day wash again with tar soap and warm water and apply No. 1, and so on.

Almer L. Maland, Rushford, Minnesota.

2. Mange, or Any Skin Trouble.—Also good for dogs. —One bottle of Babbitt's Concentrated Lye dissolved in ½ gallon of water. Add 4 pounds of Sulphur and stir until dissolved. Put contents into 40 gallons of water and then add 5 ounces of Sulphuric Acid. Rub animal from head to feet with the mixture. It will cure the worst case.

H. B. Gentry, Bloomington, Indiana.

NAIL IN FOOT.—Crush peach leaves and moisten slightly, press or inject into the wound the juice or moisture obtained, then bind on to wound a poultice of the moist crushed leaves. This is the best remedy that in over forty years' experience as a farmer I have ever known. It is a most remarkable remedy for wounds, swellings and malignant sores of any kind, and is just as good for use on man as beast. It is also a remarkable antiseptic.

S. Alexander, Birmingham, Michigan.

NAIL PUNCTURE.—Clean out the puncture at once and stand the foot for two or three hours in a strong lye made of hardwood ashes and hot water. Then make a poultice of Indian meal and this lye and apply to wound, keeping it on for six or eight hours and changing frequently to keep poultice as hot as possible. The lye kills the poison and lockjaw will not set in. This remedy is also good for man.

D. H. Clifton, De Cliff, Ohio.

NAIL WOUNDS.—A splendid and *never failing* remedy is a liberal application of Antiphlogistine (found at any drug store). Wash off and repeat as the occasion may demand.

W. A. Langford, Richmond, Kentucky.

OVER EATING, WHEAT OR OTHER GRAIN.—Give the following:

Common or Baking Soda.... 4 tablespoonfuls.
Ginger..... 1 tablespoonful.
Lukewarm Water..... 1 pint.
Mix and give as a drench and this will neutralize the gas.

One-half an hour afterward give:

Saltpeter ..... 1 tablespoonful.
Raw Linseed Oil..... 1½ pints.
Dissolve the Saltpeter in hot water, mix it with the oil and give it as a drench.

If the horse is not better, treat the same as in ACUTE INDIGESTION, only do not give any water to drink for twenty hours. *George Campbell, Gilchrist, Simcoe Co., Ontario.*

PNEUMONIA, OR LUNG FEVER.—Raw whiskey with soft food is the most effective medicine. If the horse is cold, give him a quart for first dose, then in quantities to keep warm. Under no circumstances feed grain to a horse suffering with this disease. When he lies down, he is either dead or improving. If the latter, let him sleep as long as he will, then be very careful about feeding.

W. A. Langford, Richmond, Kentucky.

POLL EVIL.—See remedy for FISTULA and POLL EVIL given by *John D. Allen, Worthington, Indiana.*

RINGBONE, BUNCHES, STIFF JOINTS, ETC., LINIMENT TO REMOVE.—

Turpentine..... 4 ounces.
Salt ..... 1 tablespoonful.
Eggs, whites of..... ½ dozen.
Shake thoroughly together and apply.

W. A. Eastwood, Chesaning, Michigan, R. F. D. 2.

SCRATCHES.—

Vaseline..... 1 ounce.
Sugar of Lead..... 1 "
Carbolic Acid..... 10 drops.
Make into an ointment.

Cleanse thoroughly with castile soap and warm soft water, rub gently with a soft cloth until dry, then apply the ointment.

R. H. Rogers, Hudson, Michigan.

2. Scratches.—Give the horse each day enough Epsom Salts to keep the bowels loose, and apply the following:

Nut Gall	2 ounces.
Copperas	2 "
Blue Vitriol	2 "
Alum	2 "
Cider Vinegar	½ gallon.

Warm until dissolved and rub in well.

Jacob Shearley, Franklin, Pennsylvania.

3. Scratches.—Wash the affected part clean with strong soapsuds and apply freely Gombault's Caustic Balsam. Have known this to cure when all other remedies had failed.

W. A. Langford, Richmond, Kentucky.

4. Scratches.—The best remedy I have found for Scratches is to clean the horse's legs thoroughly, rub dry, then apply White Lead softened by mixing with Linseed Oil. Apply each night until cured.

James M. Ross, Fairmount, West Virginia, R. F. D. 3.

5. Scratches and Grease Heel.—

Apple Vinegar	1 quart.
Litharge	4 ounces.

Put in a pot, simmer to one pint, strain and let cool. Wash the affected part with castile soap and warm water, dry and apply the liquid cold, either with a soft brush or cloth. Keep the animal in a dry place.

Robert E. Chambers, Spencer, Indiana, R. F. D. 1.

6. Scratches, Grease, Wounds and Bruises.—The following is a remedy I have used for a long time and have found to be an excellent thing for healing all kinds of wounds and bruises where the skin is broken. Also where the skin is irritated, such as scratches, grease, etc. The men working for me often use it for chapped or cracked hands in the fall and spring.

Sulphate of Zinc	1 ounce.
Sugar of Lead	1 "
Alum, pulverized	1 "

Add enough water to make 1½ quarts, shake thoroughly, apply to parts affected with a soft sponge or cloth. If for

scratches, wash first with warm water and white castile soap and apply morning and night till cracks heal and the soreness is gone. *L. D. Arnold, Bergen, New York.*

SHOULDERS OF HORSES, LUMPS ON, CAUSED BY COLLARS.—

Biniodide of Mercury	1 drachm.
Lard	1 ounce.

Mix and rub a little on hard lumps once every ten days till they disappear.

Walter Whitfield, Sr., Pontiac, Michigan, R. F. D. 6.

Shoulders, Sore.—See that the collar fits well and keep it perfectly clean. Bathe the shoulders three times a day with cold water and lots of salt, and apply to the raw surface a lotion composed of the following:

Sulphate of Zinc	1 ounce.
Acetate of Lead	1 "
Carbolic Acid	1 drachm.
Water, soft	1 pint.

Shake well together.

J. Kearns, Palmerston, Ontario, Canada.

Shoulders, Swelling of.—

Sugar of Lead (solution)	1 pint.
Arnica	4 ounces.

Apply once a day for three days in succession, then stop for three days, then repeat the process again and so on until the swelling has left. To obtain the best results the horse should be given an absolute rest during the time it is treated.

Valentine Thoeny, Tell, Wisconsin.

SORES, OLD OR FISTULOUS.—Pyroligneous Acid. Reduce with equal parts of water.

I used this remedy on a horse that had a bad sore on his neck or shoulder. I first cleansed it with Castile soap and soft water and then applied the remedy as a wash, using a syringe so as to reach all parts of the sore. The sore finally healed up in fine shape, after using other remedies and being out of the use of the horse for about three months.

Note.—It is important with sores like the above that they be allowed to drain well and not have a sac that holds the fluids and prevents drainage. *A. B. Brown, Alexandra, South Dakota.*

Sores, on Neck, Back, Shoulders, Etc.—See remedy for Warts given by *F. E. Battle, Marlin, Texas.*

SPAVIN.—

Corrosive Sublimate	2 drachms.
Lard	1 ounce.
Tar	½ "
Cantharides	2 drachms.

This blister should be thoroughly rubbed in with the hand for about ten minutes. Twenty-four hours afterward apply a little oil or vaseline, and repeat night and morning until the blister heals. *Bartley Jost, Alma, Wisconsin.*

2. **Spavin, Curb, Bunches, Sweeny, Lameness, Etc.**—Use Gombault's Caustic Balsam in the following manner: Rub the flesh briskly with a coarse towel to cause irritation, then apply the Caustic Balsam in small quantities, rubbing it in with the hand very thoroughly until the flesh becomes tender. In twenty-four hours apply more Balsam, but without much rubbing. The best time to make these applications is in the evening when a piece of flannel can be put over the affected part and allowed to remain until morning. After the second application leave entirely alone for the next five days, then repeat the same treatment and thereafter at intervals of five days until you feel that the cure is complete.

Almer L. Maland, Rushford, Minnesota.

3. **Spavin, Splints, Ringbone, Enlargement of Glands, Blister for.—**

Lard	1 pound.
Turpentine	4 ounces.
Powdered Flies (Cantharides)	3 "
Biniodide of Mercury	6 drachms.

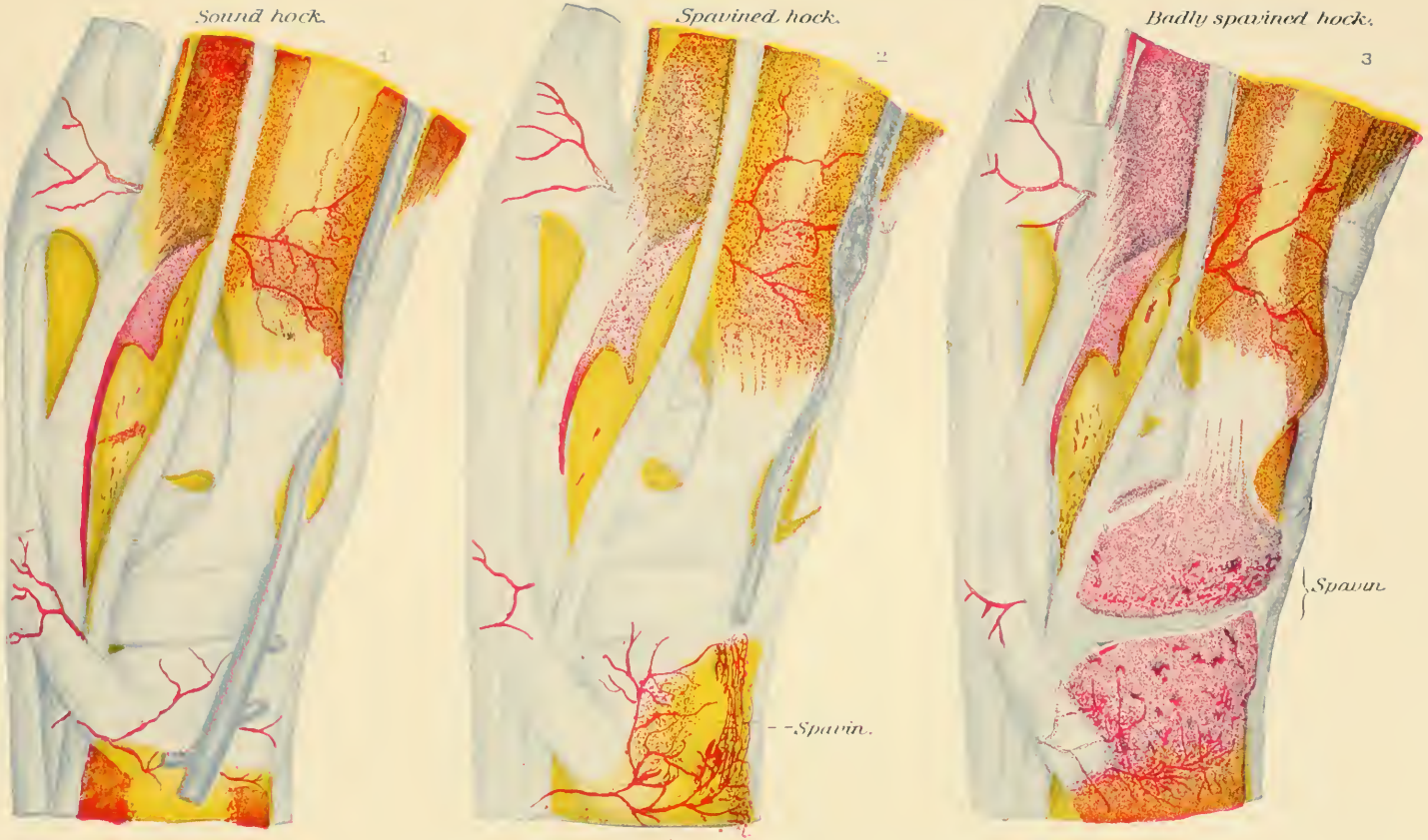
Mix thoroughly together and apply. Heal raw surface with oil of vaseline.

Bartley Jost, Alma, Wisconsin.

4. **Spavin, Ringbone, Bog Spavin, Wind Galls.—**

Cantharides	2 ounces.
Mercurial Ointment	4 "
Tincture of Iodine	5 "
Turpentine	4 "
Corrosive Sublimate	5 drachms.
Lard	1½ pounds.

Mix the other ingredients thoroughly into the lard.



BONE SPAVIN, HOCKS, WITH SKIN REMOVED.

For Ringbone or Bone Spavin cut off the hair from the part affected, anoint the lump with the ointment and rub in well with the hand. In two days grease with lard, and in two days wash off with soap and warm water and again apply the ointment and repeat as before.

G. R. Padelford, Hastings, Michigan.

5. **Spavin, Bone.**—Take soft soap, salt and Turpentine and mix together to make a soft salve. Apply three days, then leave off three days, but rub gently each day; then apply six days; rub gently again until a yellow matter oozes out, then apply once in two or three days as long as swelling lasts.

W. A. Eastwood, Chesaning, Michigan, R. F. D. 2.

6. **Spavin, Bone.**—A few years ago, while living in southern Minnesota, I became acquainted with a prominent veterinary surgeon who was very successful in removing spavins. The remedy became so popular that hundreds of farmers paid $2.50 for the recipe. Having a valuable horse that "went lame," I called the doctor and he informed me the trouble was due to a spavin. Following is the recipe, which I used with success:

Iodine Crystals	30 grains.
Iodide of Potash	20 "
Cantharides, powdered	40 "
Corrosive Sublimate	1 drachm.
Red Iodide of Mercury	2 drachms.
Vaseline, add to	1 ounce.

Dissolve the Iodide of Potash in a few drops of water (10 or 15), add the Iodine Crystals, which will readily dissolve, and mix this with the Vaseline. Then add the Corrosive Sublimate and the Red Iodide of Mercury, mix thoroughly and add the powdered Cantharides. The prescription should be prepared in a porcelain or glass vessel. The mortar used by druggists is convenient, or a flat piece of glass, as a window pane, may be used. In the last case make a wooden knife with a broad, flat blade, break down the lumps of Iodide of Potash in the water, add to the Vaseline, add the other ingredients as described and mix thoroughly. In mixing in iron or any metal the metal will unite with the Iodine Crystals, the Corrosive Sublimate and the Red Iodide of Mercury.

How to Apply.—First wash the spavin with warm water and soap, thoroughly, then clip the hair close over the spavin and

apply the remedy, rubbing it in for five minutes or more. Make a second application the second or third day, first washing the surface perfectly clean with soap and warm water. Three applications are usually enough, although each spavin must be treated according to its needs. The remedy will destroy the growth, and when it has all, or nearly all, disappeared, wash clean and apply Sweet Oil once or twice a day until the surface heals. After the first application the leg will be quite sore and it will require patience in the further treatment.

S. J. Wilson, M. D., 88 High St. W., Detroit, Michigan.

Dr. Wilson is one of the most reliable physicians in Detroit. He says he knows of 25 or 30 cases where this remedy has cured bone spavin, and he absolutely guarantees this recipe if used as instructed.—Publishers.

SPLINTS.—I have found that the Tincture of Iodine applied daily for four or six weeks will in some cases remove splints.

Elmer C. Wood, Mt. Gilead, Ohio.

SPRAIN.—Bandage with salt and vinegar as warm as the horse will stand it.

J. Woodard, New Comerstown, Ohio.

SWEENY, OR CURB.—Or for any hard lump the following liniment is good:

Sweet Oil.
Cantharides.
Hartshorn.
Origanum.
Camphor, equal parts of each.

J. Davis, Liberty, Indiana.

2. Sweeny.—

Carbonate of Ammonia	1 ounce.
Gum Camphor	1 "
Turpentine	⅓ pint.
Alcohol	⅔ "

Apply three times daily, rubbing thoroughly, then skip three days. Repeat three times, after which grease. This is good liniment for sprains or bruises.

R. H. Rogers, Hudson, Michigan.

3. Sweeny, Fistula, or any Enlargments or Sprains.—I consider Gombault's Caustic Balsam the best remedy I have ever used. *C. B. Keys, Richland Center, Wisconsin.*

4. **Sweeny Liniment.**—

Spike, Oil of	1 ounce.
Amber, Oil of	1 "
Wormwood, Oil of	1 "
Origanum, Oil of	1 "
Spirits of Turpentine	1 "
Hartshorn	1 "
Alcohol	½ pint.

J. W. Higgs, Silver Leaf, North Dakota.

THOROUGH-PIN.—See remedy for Bog-Spavin given by *J. Kearns, Palmerston, Ontario, Canada.*

THRUSH.—Clean the foot out clean, then pour the Essence of Salt (Muriatic Acid) in around the frog and hold the foot up until it quits boiling. Do this once every three days until it is dried up.

J. Davis, Liberty, Indiana.

2. **Thrush.**—To be applied externally:

(*a*)	Carbolic Acid	½ ounce.
	Spirits of Nitre	3 ounces.
	Sweet Oil	2 "
	Verdigris	4 drachms.
	British Oil	3 ounces.

The above should be compounded by a druggist as the combination is explosive.

To be given internally:

(*b*)	Cream of Tartar	3 ounces.
	Nitrate of Potash	3 "
	Podophyllin	2 "
	Ginger	2 "
	Sulphate of Iron	2 "
	Fenugreek	1 ounce.

Apply "*a*" once a day for three days; give "*b*" twice a day for three days. Repeat till cured. I have found this good for Scratches also.

D. TerBush, Fenton, Michigan, R. F. D. 4.

3. **Thrush in Horses or Cattle.**—Use equal parts of lard, pine tar and Blue Vitriol. Pulverize the Vitriol, warm the lard and mix all together. Clean out all decayed parts and dirt and

apply once a day for a week. Follow with applications of common salt. If no better in two weeks, use the first another week and follow with salt as before.

William A. Hale, Anamosa, Iowa.

THROAT, SWELLING IN, TO REDUCE.—

Iodide of Potassium	4 drachms.
Oil of Hemlock	2 ounces.
Turpentine	3 "
Oil Stone (liquid)	2 "
Wormwood	1 ounce.

Mix all with Alcohol, 8 ounces; add Tincture of Cantharides, 2 ounces.

Rub swelling thoroughly with this lotion, leave it on for three or four days or even a week, then grease for a day or two. If the swelling is not reduced sufficiently, wash off grease and apply the blister again. Repeat until cured.

D. TerBush, Fenton, Michigan, R. F. D. 4.

URINE, RETENTION OF.—For stoppage of water, 1 tablespoonful of Turpentine to 6 tablespoonfuls of warm water on the small of the back. This remedy has never failed with us.

D. C. & C. B. Cook, Cazenovia, New York.

2. **Urine, Retention of.**—When horse cannot pass urine, give Sweet Spirits of Nitre, 1 ounce, and increase, if not relieved, to 1½ ounces mixed with 1 drachm Cantharides (Spanish Fly.) Give every half hour until relieved. Rub back with Camphor or a mixture of mustard and ginger.

Almer L. Maland, Rushford, Minnesota.

3. **Urine, Retention of.**—To relieve a mare of her water insert half of an onion, a small lump of salt or a little pepper in the vagina at the ends of your fingers as far as possible. This done at first will draw her water in ten minutes. This does not cure the animal but simply relieves her. Follow with mixture No. 1, or with mixture No. 2, if it is thought to be wind colic. (See Colic remedies Nos. 13 and 14 over Mr. Hale's name.) Blanket well if cold weather.

Wm. A. Hale, Anamosa, Iowa.

WARTS.—There are two kinds of warts—the cancer or bloody, and the dry or seed wart. Should it be the dry or seed wart, make the outer surface raw with a knife and then apply the following:

Copperas	½ ounce.
Calomel	½ "
Alum	½ "

In preparing this, grind the Calomel and Copperas together, burn the Alum, mix all together and apply dry to the raw surface as often as the scab sloughs off until cured. This is a good remedy for sore necks, backs, shoulders, etc., also for destroying proud flesh.

F. E. Battle, Marlin, Texas.

WIRE CUTS.—The free and frequent use of common coal oil will heal up a wire cut as rapidly and perfectly as any liniment I have ever used or any preparation prepared by a veterinary surgeon.

J. P. Steele, Winterset, Iowa.

2. **Wire Cuts and Bruises, Salve for.**—

Lard (fried out of old pork)	½ pint.
Pine Tar	½ "

Mix and apply freely to sores. It will keep off the flies, heal up the wound quickly and leave no scar.

Ernest Heine, Ellendale, North Dakota.

3. **Wire Cut, or Any Raw Sore.**—Take equal parts of Ammonia, *pure* cider vinegar, eggs and Turpentine. Shake well, let stand twelve hours and apply with syringe twice a day. Will keep sore clean and heal it rapidly from the bottom.

W. I. Reynolds, Pipestone, Minnesota.

4. **Wire Cuts, or Flesh Wounds.**—Pulp onions and boil in clean, sweet lard. Get as strong of onion flavor as possible. Strain and keep clean. Apply on fresh wire cuts or flesh wounds once a day. It will cleanse the wound and prevent calloused edges, which are so common in wire cuts. I have found this an infallible remedy.

A. L. Stutzman, New Sharon, Iowa.

WORMS.—Mix a handful of strong fine-cut tobacco with the oats or bran once a day for a week. Home-grown tobacco dried and pulverized is the best.

D. F. Pike, Lisbon, Ohio.

2. **Worms.**—

Sulphate of Iron	1 drachm.
Tartar Emetic	1 "
Linseed Meal	2 drachms.

Mix and give as one dose.

Give this dose twice daily for one week and then give as follows:

Spirits of Turpentine	1 ounce.
Linseed Oil, raw	1 pint.

Mix and give as one dose.

A. B. Brown, Alexandria, South Dakota.

3. **Worms in Horses, Long Round.**—Give:

Spirits of Turpentine	1 ounce.
Raw Linseed Oil	½ pint.

I also give a teaspoonful Sulphate of Iron in the feed twice a day. If a horse is fed 4 quarts raw potatoes twice a week they will kill bots or worms. Salt and hardwood ashes mixed in equal parts, and about 2 tablespoonfuls given in their oats or soft feed is also very good.

George Campbell, Gilchrist, Simcoe Co., Ontario.

WOUNDS OR CUTS, APPLICATION FOR.—

Alcohol	1 pint.
Camphor	1 ounce.
Saltpeter	1 "
Gum Guiacum	1 "

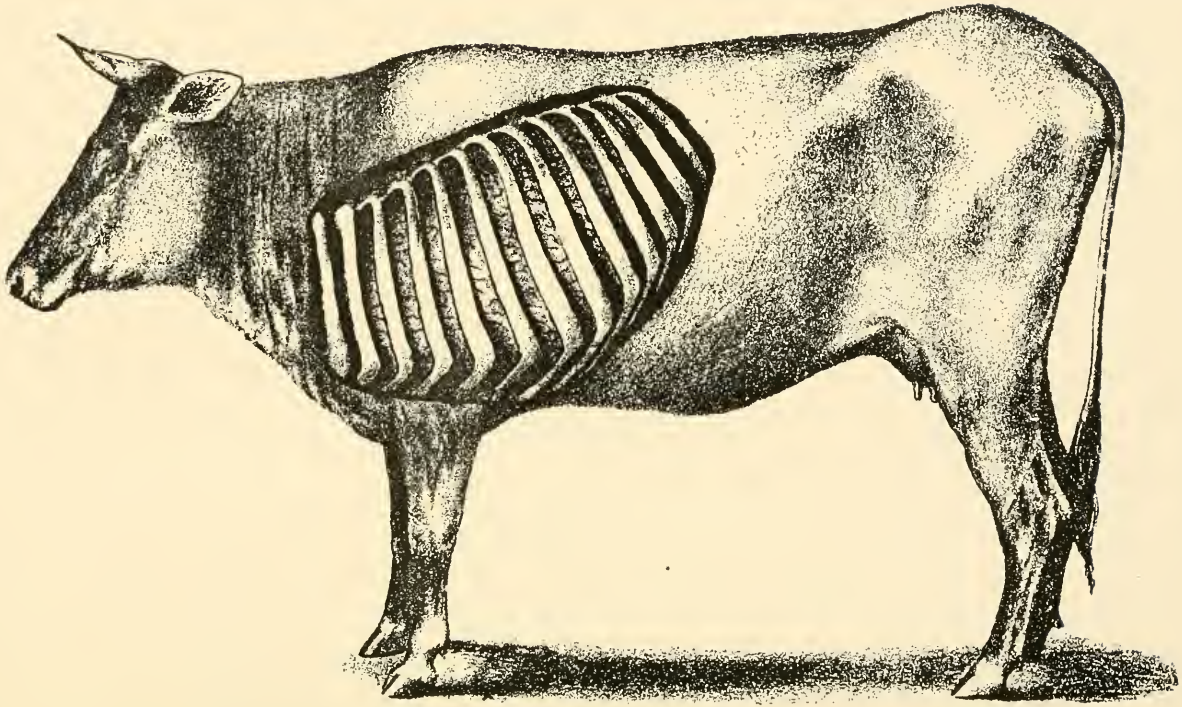
John Oatway, Green Ridge, Manitoba, Canada.

2. **Wounds, Fresh.**—

Lard	1 pound.
Rosin	¼ "
Eggs, white of	2

Heat the lard and rosin and when nearly cold add the eggs.

D. TerBush, Fenton, Michigan, R. F. D. 4.



POSITION OF THE LUNG.

REMEDIES FOR CATTLE

TO KEEP CATTLE IN HEALTH.—Give 1 heaping tablespoonful of leaf tobacco once a week in wheat bran.

Robert E. Chambers, Spencer, Indiana, R. F. D. 1.

COW POWDER.—The following is a very good cow tonic:

Saltpeter	1 part.
Copperas	3 parts.
Rosin	4 "
Sulphur	5 "
Wood Soot	6 "

Mix thoroughly and give 1 tablespoonful a day.

Hiram Graham, Franklin, Pennsylvania, R. F. D. 1.

MISCELLANEOUS INFORMATION.—When a cow or steer gets sick and begins to lose flesh, examine the tail, and if at the end of the tail bone it seems hollow or flabby, split the hollow and fill with common salt, then wrap with a rag saturated with Turpentine. This will be all the attention necessary.

If sick from overeating or eating frozen corn or damaged food, give one quart Castor Oil.

W. A. Langford, Richmond, Kentucky.

SUGGESTION FOR CARE OF.—I think cattle do best when turned out and have as many different kinds of rough feed as it is handy to give them. Keep the consumptives out of your cattle, also the lump jaws.

S. W. Powell, Polo, Illinois.

ABORTION, TO PREVENT.—Take 1 ounce of pure Carbolic Acid and mix thoroughly with 1 gallon of salt. For fifteen cows feed this amount every four weeks; for a less number, feed in proportion.

For Contagious Abortion separate each cow that has aborted from the herd and treat in the following manner: Give each cow 10 drops of pure Carbolic Acid diluted in 3 pints of water

sprinkled in ground feed, a day for two weeks; then skip a week, then repeat the treatment for two weeks again, continuing this for two months and gradually increasing the dose to 14 drops.

Also obtain a bottle of Lysol, and for each cow take 1 ounce of Lysol to 3 quarts lukewarm water, mix thoroughly and inject the solution with a syringe (½ pint metal is the best) into the vagina of each, three times a week for three months.

T. M. Scott, Winterset, Iowa, R. F. D. 1.
(Breeder of Aberdeen Angus Cattle.)

AFTERBIRTH, TO REMOVE—WHEN COW STRAINS HARD.—Fasten animal between two planks or walls to prevent jumping sideways and tie up short. Enter vagina with oiled hand, follow afterbirth carefully into womb and loosen same along the walls of the latter.

Where cow does not strain hard, give 1 quart Linseed Oil 2 to 3 times a day and afterbirth will come loose in a short time.

Ernest Heine, Ellendale, North Dakota.

Afterbirth, Retention of the.—To a cow that does not clean herself after calving I give a tablespoonful of Saltpeter three times a day. This is a certain cure.

I. M. Hume, Williamstown, Kentucky.

BLACK LEG, TO PREVENT.—I have for many years used the following remedy as a preventive of Black Leg among young cattle, and when I have used it regularly have never had a case of the disease. I am confident that it is a preventive if used for two or three weeks before the disease would naturally attack the calf, but will not cure if the animal has already been attacked.

Sulphur	10 pounds.
Copperas	6 "
Saltpeter	3 "
Lime, air-slacked	3 "

Pulverize and mix and use in the salt trough in the proportion of one to four, or not to exceed one to three.

J. P. Steele, Winterset, Iowa.

2. **Black Leg, to Prevent.**—

Copperas	1 pound.
Saltpeter	1 "
Lime, air-slacked	1 "
Sulphur	2 pounds.
Ashes, from hard wood	3 "

Mix with 20 pounds of common salt and use same as common salt, keeping it before the cattle all the time.

In thirty years' use I have never had a case of Black Leg.

John Schoenberger, East Peru, Iowa.

3. **Black Leg.**—Put small teacupful of salts and ½ teacupful of common salt into a quart of water. Shake until thoroughly dissolved and give to animal as soon as found. Repeat in about four or five hours. If animal is still alive in the morning, give twice a day for two days.

It is a common belief among people that there is no help for an animal that has an attack of Black Leg, and perhaps that is so. I have lost a good many cattle by this disease, and never had one recover after it was attacked until I used the above simple remedy. I have saved about fifty per cent. since using it.

G. D. Foster, Kingfisher, Oklahoma.

BLOATING.—Use trocar if possible. If same is not at hand, use small-bladed knife and tap the paunch half way between the last rib and the hip bone. Enter an open goose quill or clean pipe stem into cut and let gas escape. When down to usual size, remove quill, apply a salve of Turpentine and lard (equal parts) to wound and leave alone.

Ernest Heine, Ellendale, North Dakota.

2. **Bloating.**—When cattle are sick and bloat, give Camphor, 2 tablespoonfuls to a dose, mixed with water about 1 pint. Dose may be repeated in half hour if necessary. Seldom have to give more than two doses. Relieves at once.

Harmon Rossman, Lakeview, Michigan.

3. **Bloating, or Colic.**—One quart buttermilk, 1 tablespoonful soda. Put soda in when ready to drench. Shake the bottle, pull the cork and drench at once.

Robert E. Chambers, Spencer, Indiana, R. F. D. 1.

4. **Bloating.**—Either tie the animal up or get it into some enclosure where it cannot get away from you and pour cold water on back or sides, where bloat is shown. Continue this pouring of water for fifteen or twenty minntes if need be. I have had a good many cases of bloating and never failed with this remedy but once; then I used a trocar.

Tilman Wilkin, Spencerville, Ohio.

5. **Bloating.**—

Sal Ammoniac	1 drachm.
Whiskey	½ pint.
Water	1 pint.

Give as one dose. If not relieved in half an hour, repeat the dose.

Bartley Jost, Alma, Wisconsin.

6. **Bloating in Cattle.**—Take a round piece of wood about 2½ to 3 inches in diameter, and 12 inches in length. Put as a gag crosswise in the animal's mouth; make fast and leave until the gases escape.

Isaac Salkeld, Goderich, Huron Co., Ontario.

7. **Bloating.**—Give ½ pint common beans, uncooked. Of course the animal will not eat them and they have to be forced down the throat.

This remedy was given me by an old physician one day when calling at my home. Shortly after I had an animal with a bad case of bloat and tried the above with perfect success, complete relief being had in fifteen minutes.

A. B. Dickerson, Lakeview, Michigan.

8. **Bloating.**—Last week one of my cows got the bloat—ate too many cold (not frozen) pumpkins. Breathed so hard could be heard rods away. I took 2½ ounces of baking soda and mixed it into a ball with wheat flour and a little water, put it down her throat, and in two hours she was over it and eating hay.

D. F. Pike, Lisbon, Ohio.

9. **Bloating.**—For bloating in cattle I give:

Common Soda.....	4 or 5 tablespoonfuls.
Ginger.....	1 tablespoonful.

I also put a wooden gag with a hole in the middle of it in the beast's mouth and leave it in for half an hour. If the bloating does not subside, I remove the gag and give the following:

Spirits Turpentine.....	2 ounces.
Common Soda.....	2 tablespoonfuls.
Raw Linseed Oil.....	1 pint.

Mix and give as a drench, and replace the gag again, repeating remedy every three hours.

If the case is very bad, I puncture and let off the gas. If cattle bloat from eating too much grain, treat them the same, only do not let them have water to drink for twenty hours.

Geo. Campbell, Gilchrist, Simcoe, Co., Ontario.

10. **Bloating, Clover.**—Stand the beast with front feet on higher ground than hind feet. Also tie stick in mouth and run the animal.

To prevent trouble, keep salt before cattle at all times and have plenty of good fresh water.

W. R. Sedberry, Pittsfield, Illinois.

CAKED UDDER.—When cow calves and her udder becomes caked, the following is a very quick and sure remedy: Equal parts of mutton tallow, beeswax and rosin. Melt together and add a little Currier's Oil to make it spread on the udder better.

Harmon Rossman, Lakeview, Michigan.

2. **Caked Udder.**— Rub well with Flaxseed Oil or hog's lard.

John P. Woodard, New Comerstown, Ohio.

3. **Caked Udder.**—First give 1½ pounds Epsom Salts, then hand rub and bathe the udder with hot soapsuds.

Thos. Newbggins, Atwood, Ontario, Canada.

CHOKING.—If the apple, or whatever it is, cannot be worked up and out, take a piece of rubber hose and push it down. Never take a whip stock or broom handle.

D. F. Pike, Lisbon, Ohio.

2. **Choking.**—For a choke, use a piece of gum hose to dislodge the obstruction.

W. A. Langford, Richmond, Kentucky.

3. **Choking.**—If the obstruction can be felt from the outside, try to work it down with the hands, first putting a little Linseed or other oil down the throat. If this fails take a common buggy whip, wrap a little soft cloth around the butt end, and after securely tying it on raise the nose to a level with the body, put the butt end of the whip down the throat until the obstruction is reached and gently force it into the stomach. A clevis put crosswise in the mouth will hold it open.

C. B. Keys, Richland Center, Wisconsin.

4. **Choking.**—For apple in the throat take the cow by the nose, open the mouth and break one egg, shell and all, into the mouth, and the apple will come out.

I have tried this several times.

D. C. Cook, Cazenovia, New York.

5. **Choking.**—Pour down the throat ½ pint of lard, or ½ pint of soft soap reduced with warm water, or the white of four eggs.

John P. Woodard, New Comerstown, Ohio.

6. **Choking, Sure Cure.**—Take fine cut chewing tobacco, the stronger the better, enough to make a ball the size of a hen's egg, dampen it with molasses or any similar substance so that it will adhere closely, raise the animal's head, pull out the tongue and put the ball down the throat as far as possible. In a short time it will cause sickness and vomiting, which relaxes the muscles so that whatever is choking the animal will be thrown up. If any person thinks this will not work, just let him try it on himself, especially one who is not used to tobacco, and see how quickly it will work. It is a simple, sensible and positive remedy.

Fred. M. Warner.

COLIC.—See remedy for Colic in horses given by *Geo. M. Wilber, Marysville, Ohio.*

2. **Colic.**—Cattle as a rule do not need much doctoring if properly fed and cared for. One remedy for Colic that I like very much is the following:

Whiskey ..... ½ pint.
Black Pepper..... 1 tablespoonful.
Ginger..... 1 "

Mix in a pint of lukewarm water and give as a drench.

If the animal does not get relief, follow up in an hour with another like dose. The danger of this disease is that it may terminate in inflammation of the bowels.

L. D. Arnold, Bergen, N. Y.

3. **Colic.**—For colic in cattle give the following:

Spirits Turpentine..... 1½ ounces.
Raw Linseed Oil..... 1 pint.

Mix and give as a drench every two hours until relieved.

Another good remedy is:

Black Pepper..... 1 tablespoonful.
Whiskey..... ½ pint.
Lukewarm Water..... 1 pint.

Mix and give as a drench. If the beast is not better in two hours, add ten drops Fleming's tincture aconite to the turpentine-oil recipe, and give as a drench.

George Campbell, Gilchrist, Simcoe Co., Ontario.

CORNSTALK SICKNESS.— This is not a disease, but a sickness due to the farmer's own fault. He turns cattle that have been running in pasture, and perhaps half starved, into a stalk field, and they fill up with dry feed until the stomach becomes impact. Let them into the stalks by degrees and see that they have plenty of water and some soft feed and there will be no trouble. I have seen more cattle lost by this sickness than by all other diseases put together.

I. W. Higgs, Silver Leaf, North Dakota.

2. **Cornstalk Sickness.**—There is no cure for this when once the animal has it, but there is a preventive that has never failed for me when I have followed it. Feed the cattle all the

corn fodder with the corn on, or if there is no fodder, feed them all the corn they will eat for two weeks before turning them into the cornfield. Since following this plan I have never lost a head, but before I found it out I always lost several head.

Joseph Hynek, Wilber, Nebraska.

3. **Cornstalk Sickness, or Impaction.**—A strong infusion of Tansy given in frequent doses of a pint or more at a dose will bring about the desired effect if persisted in. I have never known this simple remedy to fail in a case of impaction when the treatment was thorough.

A. L. Stutzman, New Sharon, Iowa.

EYES, SORE.—Feed soft feed for 24 hours, and purge with Epsom Salts, 1 to 1½ pounds. Give ¼ to ½ amount for a calf. Keep in a partly darkened stable and bathe the eyes 3 times a day with lukewarm water, and after bathing put a few drops of the following lotion into each eye:

Sulphate of Atropia	4 grains.
Water	2 ounces.

J. Kearns, Palmerston, Ontario, Canada.

FEET, SORE.—First clean the foot well by drawing a rope through between the hoof, then apply the following remedy:

Linseed Oil	2 parts.
Lard	2 "
Carbolic Acid	1 part.

Mix thoroughly and apply.

Gurley Taylor, Boonville, Indiana.

2. **Feet, Sore.**—Sore feet, particularly in cattle that are being fitted for show purposes, can be cured as follows:

Tie the animal up short to a good strong post. Insert a small round post between the hind legs, and with a man at each end of the post to lift, the foot can be raised from the ground and the hoof paired with a strong, sharp knife. Then dissolve 8 ounces Blue Vitriol in 1 quart warm water and wash the foot. This will take three men—one at each end of the pole and one to pare the hoof.

Geo. E. McEathron, Tepeeotah Stock Farm, Huron, South Dakota.

FOUL FOOT IN CATTLE.—Caused by filth, or injury and filth, and prevents growth of animal until cured.

Tie the animal, stretch the leg back, clean between the hoof by running wet rag back and forth, and apply finely pulverized Blue Vitriol. *W. W. Reynolds, Utica, Ohio.*

FOOT EVIL.—Can be cured in its early stages by applying Spirits of Turpentine from one to three times freely to the affected parts. *W. R. Jewell, Alkires Mills, West Virginia.*

2. **Foot Evil.**—A sure cure for the disease. Thoroughly pulverize 4 ounces of Blue Vitriol, add 4 ounces of Calomel, then 1 ounce of Borax. Apply with swab twice a week until a cure is effected. *Chas. E. Haynes, Hillsboro, Ohio.*

3. **Foot Evil.**—Use Butter of Antimony or Oil of Vitriol. Whichever is used, apply it directly to the part affected. If the burn causes too much soreness, apply lard or some soft oil to cause it to heal. If the first application does not effect a cure, repeat in about ten days. *W. S. Starcher, Berlin, West Virginia.*

GARGET.—Give 10 drops Tincture of Iodine in feed once a day until cured. Have found this a positive cure.

D. TerBush, Fenton, Michigan, R. F. D. 4.

HOLLOW HORN.—See MILK FEVER OR HOLLOW HORN, given by *John D. Allen, Worthington, Indiana.*

2. **Hollow Horn, or Indigestion.**—Give ¼ pound Glauber Salts every third day until cured.

W. S. Starcher, Berlin, West Virginia.

HORN DISTEMPER.—The following is a German remedy and one which I have found to be very successful.

Salt	3	tablespoonfuls.
Black Pepper	3	"
Ginger	3	"
White Hen Manure	3	"
Wood Soot	3	"

Add three fresh eggs and mix with flour to make three pills. Give one pill three mornings in succession.

Hiram Graham, Franklin, Pennsylvania, R. F. D. 9.

HORNS ON CALVES, TO KILL.—As soon as the horn appears, clip off the hair around the button and rub with Caustic Potash until the horn becomes red and inflamed.

D. TerBush, Fenton, Michigan, R. F. D. 4.

INDIGESTION.—See HOLLOW HORN OR INDIGESTION, given by *W. S. Starcher, Berlin, West Virginia.*

2. **Indigestion in Dairy Cows.**—I keep a herd of Jersey cows, and find this the best cure for indigestion: Take from 1 to 1½ pounds Epsom salts—according to size of cow—and two tablespoonfuls ginger. Mix with one-half gallon of water and give as a drench at one dose.

Ginger—one tablespoonful in feed once or twice a day—is almost a sure preventive of indigestion.

James W. Ross, Fairmont, West Virginia, R. F. D. 3.

LICE ON CATTLE.—Take what Calomel can be held on the end of a jacknife, or ¼ teaspoonful, and deposit in the hollow at the back of the head. Lice are found mostly along the spine and they travel over the head to the nose for moisture. The Calomel destroys them, and at the same time is placed where the animal cannot lick it and become injured by it.

C. B. Keys, Richland Center, Wisconsin.

2. **Lice.**—Sprinkle wood ashes all over the animal.

John P. Woodard, New Comerstown, Ohio.

3. **Lice on Cattle.**—Boil one-half bushel of potatoes in four gallons of water until the potatoes are nearly soft, then take the water the potatoes are boiled in and wash the cattle (on a warm day) from eyes to tail and half way down each side. Repeat in a week.

D. F. Pike, Lisbon, Ohio.

4. **Lice.**—To prevent cattle from getting lousy take:

Common Salt	10 pounds.
Sulphur	2 "
Saltpeter	½ pound.

Mix and put in a box where cattle can have access to it at all times and you will have no lice on them.

George Campbell, Gilchrist, Simcoe Co., Ontario.

LUMP JAW.—A local ailment peculiar to head and upper part of neck only. Caused by the introduction of a vegetable parasitic spore into the tissue or at the surface of bone or tooth, the multiplication of which irritates. Ailment shows at first by a small lump, which, if let alone, grows for months or years, causing death from pain and emaciation. If in the bone, it honeycombs it full of pus; if in the tissue, there is a pocket of it. In either case it finally breaks, but never works its own cure. If the germs are not destroyed or removed, the animal dies a lingering death. There is small chance for destruction or removal except during the early stage.

Treatment.—A destruction of the germs is very probable by a daily drench of one drachm of Iodide of Potassium in a pint of water for about ten days more or less. The animal will thrive all right, but he must be watched and the medicine discontinued when his nose inflames to interfere with breathing. Then after a few days rest, repeat again. The two efforts are almost certain in early stages, and even in advanced stages it will retard and sometimes cure.

A removal of the germs by the knife from tissue and by the chisel from bone is positively certain and the best means to adopt.

There is no reason except ignorance or carelessness why any steer should die from Lump Jaw.

W. W. Reynolds, Utica, Ohio.

2. **Lump Jaw.**—Cut the enlarged place open and insert all the air-slacked lime you can get into the incision. This will eat out all impurities. *W. R. Sedberry, Pittsfield, Illinois.*

3. **Lump Jaw.**—Cut lump open and cleanse with a strong solution of Carbolic Acid and water, than inject one-half ounce Tincture of Iodine.

Another treatment for severe cases or where lump is a hard bony growth: For a 1,000 pound animal give one-half drachm Iodide of Potash once a day for four days, then twice a day for four days, then once a day for four days. Rest one week and repeat treatment. Keep animal in barn and give in drinking water. These two treatments are entirely distinct and separate from each other. *A. L. Fox, New Sharon, Iowa.*

4. **Lump Jaw.**—When the lump first makes its appearance bathe it frequently with Kerosene or Coal Oil; if broken or a sore, use one-third Iodine and two-thirds Kerosene or Coal Oil.

F. M. Brown, Kiel, Kingfisher Co., Oklahoma.

MILK FEVER.—The following is the only remedy I have ever known to cure this dreaded disease. I have seen it used with success after a cow was down and, as I supposed, beyond help. While it is best always to give treatment at earliest possible moment, I would try it even in later stages of disease.

No. 1.—Epsom Salts..... 1½ pounds.
Ginger, powdered..... 1 ounce.

Mix together, dissolve in lukewarm water and give in one dose.

No. 2.—Aromatic Spirits of Ammonia... 10 ounces.
Spirits of Nitrous Ether..... 20 "

Mix together, and immediately after giving No. 1 begin with No. 2 by giving three ounces of the mixture in a pint of cold water every half hour until five doses are given; then every hour until the thirty ounces have been given.

No. 3.—*Mix* one pound of ground Mustard with hot water and rub in well along the back from hips forward.

Keep cow well blanketed.

John Shankland, Brooklyn, Ohio.

NOTE.—While teaching district school near Cleveland, Ohio, several years ago, the farmer with whom I was boarding had a cow show symptoms of milk fever. I drove several miles to a drug store, secured the above medicines and returned in time to save the cow. The animal was down and we supposed it was too late. It meant at least $50 to the owner, and I consider the recipe worth more than that to every owner of cattle.

Geo. Foote, Detroit, Michigan.

2. **Milk Fever.**—Place cow in a dry, warm stall with plenty of bedding. Give injections of warm soapsuds in rectum to start passage. Give twice a day the following:

Linseed Oil..... 1 quart.
Camphor Gum..... 2 ounces.
Glauber Salts..... 2 "

Rub small of back and udder with the following:

Spirits of Turpentine..... 1 pint.
Camphor Gum..... 4 ounces.
Lard..... 4 "

Milk every hour until relieved.

Ernest Heine, Elendale, North Dakota.

MILK FEVER, OR HOLLOW HORN.—Clean out womb good by inserting hand well greased. Put ½ pint of raw Linseed Oil into the womb. Apply Turpentine over small of back or kidneys and small amount on neck back of head. Also give the following:

Epsom Salts	1 pound.
Lard (warmed)	1 quart.
Ginger (pulverized)	1 ounce.

Mix well with warm water and use as a drench.

The above is infallible. Have been using it for fifteen years and haven't lost a cow.

John D. Allen, Worthington, Indiana.

MILK FEVER PREVENTIVE.—When I dry off my cows I stop all grain feed. I feed for roughage, ensilage in reduced quantity, hay and stover, until about two weeks before time to freshen, I begin to feed some bran, about two or three quarts per day, and give as much Glauber Salts every four or five days until she freshens as a man can hold in his hand by taking it real full. If cow has not had any Salts for four or five days, give immediately after calf is dropped, which I usually give in water, if cow is thirsty, when I take water to her. I take Salts with me and try her with the water, and if she seems thirsty I stir the Salts into the water and nine times out of ten she will drink it. If she seems to be a little chilly, give 2 ounces of Ginger. In no case give a cow more than 2 gallons of water at one time, and warmed a little if it be cold. Repeat at intervals of an hour or so until thirst is slacked. If the cow does not eat Salts in her food, dissolve and pour down from a long-necked bottle.

My experience is that milk fever is due to carelessness more than anything else. I have 50 cows and have not had a case in nearly three years, and only four cases in the twenty-three years I have kept cows.

D. F. Diener, Brookville, Pennsylvania.

2. **Milk Fever Preventive.**—As I have been in the dairy business for fourteen years, I might give you my experience with Milk Fever. We had some trouble at first with our best

cows, and lost some of them. The Schmidt treatment (see this treatment in CATTLE DISEASES in body of book) was our best remedy, but we have found prevention better than cure.

As there is almost no danger with a heifer the first or second calf, we feed them well when coming near their time, but after the second we are more careful, and still more so as they mature. If they are heavy milkers and in good flesh, we feed sparingly for two weeks before coming in—not more than half ration—and nothing but water in small quantities for twenty-four hours after coming in. If they appear all right the second day, we feed a little hay—less than half a feed—and gradually increase.

Since we have learned by hard experience to practice this thoroughly we have not had one case of Milk Fever. If cows are in good flesh this treatment will do them good, even if there might not be any danger of Milk Fever.

Joseph Meighen, St. Marys, Ontario, Canada.

RINGWORM.—Usually starts around the eyes and spreads back. Take a blunt knife and scrape off crust on sore, then apply a little Tincture of Iodine with a feather. If first application does not cure, apply again in one week.

Walter Whitfield, Sr., Pontiac, Michigan, R. F. D. 6.

SCOUR IN CATTLE, HORSES, CALVES, AND CHOLERA OR DIARRHEA IN PERSONS.—Frequently a handful of salt will relieve horses and cattle from scour, but if this does not afford relief in twelve hours, I have recourse to a remedy for the above disease that has never failed me. I use Spirits of Camphor, Tincture of Rhubarb and Laudanum, equal parts of each. Mix thoroughly. For a horse or cow, give a dessertspoonful; for a calf, a teaspoonful. If not relieved in three hours, repeat the dose. For grown persons I use 30 drops; for a child, 8 or 10 drops. For persons, give in a little sweetened water; for stock, in half a pint of warm water. I have known many of the worst cases of diarrhea in children to be cured in a very short time from using this remedy, and I consider it one of the most valuable recipes I have ever come across.

M. E. Wees, West Superior, Wisconsin.

2. Scour in Young Cattle or Calves.—For calf under three months of age, give 1 tablespoonful of Castor Oil twice a day; for older ones, increase the dose according to size.

Another remedy for the same: Take equal parts of Ginger, pulverized charcoal and common baking powder, mix well together and give 1 teaspoonful twice a day. Pull out tongue and throw powder on back part and they will swallow it, or give it by way of drench.

I have found the above to be good remedies.

Tilman Wilkin, Spencerville, Ohio.

3. Scours in Calves.—Put one teacupful raw flour in the milk given the calf, twice a day, until cured. If the calf is in pain give: Tincture of Laudanum, 1 teaspoonful, Raw Linseed Oil, 2 ounces, two hours after first dose is given.

George Campbell, Gilchrist, Simcoe Co., Ontario.

4. White Scour in Calves.—Give 30 drops of Laudanum in 1 tablespoonful of Castor Oil three times a day until well.

I have found this to be one of the best recipes I ever used. Never lost but one calf.

William Wales, Osborne, Kansas.

5. Scour in Calves or Lambs.—

Tincture of Catechu	6 ounces.
Prepared Chalk, powdered	3 drachms.
Laudanum	1 ounce.

Dilute in Alcohol to make one pint, shake well and give as follows: To calf, one tablespoonful every four hours; to lamb, one-half teaspoonful every five hours.

A. L. Fox, New Sharon, Iowa.

REMEDIES FOR SHEEP

TO KEEP SHEEP HEALTHY.— Give 1 teaspoonful of leaf tobacco in wheat bran once a week, and plenty of salt, and sheep will always be healthy.

If sick, give ½ teaspoonful of Turpentine and 1 tablespoonful of sorghum molasses well mixed. Give morning and evening until the sheep will eat its food.

Have used the above for twenty-five years.

Robert E. Chambers, Spencer, Indiana.

SHEEP POWDER FOR APPETITE.—

Sulphate of Iron	2 ounces.
Ginger	8 "
Fenugreek	8 "
Gentian	4 "

Mix the above with 2 gallons oil cake and feed 1 pint daily, mixed with 1 peck corn and oats.

Joseph H. Reed, Canonsburg, Pennsylvania, R. F. D. 38.

SHEEP, TO KEEP IN CONDITION.—Sheep do much better in small bunches of about fifty than they do in larger bunches. Plenty of salt and exercise are also needed for sheep.

S. W. Powell, Polo, Illinois.

BLOATING.—

Ginger	1 drachm.
Baking Soda	1 "
Spirits Ammonia (Aromatic)	2 drachms.
Water	1 pint.

Give as one dose, and if it does not have the desired effect, repeat in ½ to 1 hour, according to severity of the case.

G. R. Padelford, Hastings, Michigan.

CHOLERA, LAMB.—Sulphuric Ether given in 1 ounce doses mixed with twice the quantity of warm water or milk—dose repeated in fifteen minutes if not easier—will positively cure the so-called "Lamb Cholera" in young lambs if discovered before they are too far gone. "Lamb Cholera" is nothing but colic produced by sickness or changes in the dam's milk.

Geo. M. Wilber, Marysville, Ohio.

COLIC, OR STRETCHES.—Give one drachm each of Ginger and Soda in water as a drench; if this fails to relieve, repeat the dose in one hour and give four to six ounces of raw Linseed Oil. *G. R. Padelford, Hastings, Michigan.*

2. **Colic, or Stretches.**—Let the shepherd take the sheep by the hind legs, with its back toward him, and raise it as high as his head three times.

Isaac Salkeld, Goderich, Ontario, Canada.

CONSTIPATION IN LAMBS, TO PREVENT.—After the ewe has dropped her lamb, take a pint of bran, add a tablespoonful of salt to it, and pour over the bran boiling water to make a soft mash; let it cool and when lukewarm give to the ewe. Repeat once a day for 2 or 3 days.

George Campbell, Gilchrist, Simcoe Co., Ontario.

FLUKE WORM.—See TICKS AND FLUKE WORM, given by *W. A. Eastwood, Chesaning, Michigan.*

FOOT ROT.—

Strong brine (made with hot water)	1 quart.
Sulphate of Copper (Blue Vitriol), powdered, add all that brine will cut, then add :	
Corrosive Sublimate	¼ ounce.
Turpentine	½ "
Bottle for use.	

One application with a swab, if trimming of foot is *thoroughly* done, will effect a cure. However, the entire flock should be gone over once a week and the feet examined by using knife to see if any parts are still affected, and such examination continued until flock is *known* to be *sound*. I have known this remedy to cure large flocks of sheep (including my own) when remedies costing $10.00 per pint had signally failed. But no medicine will cure Foot Rot without it finds its way to the parasite which causes it, and this can only be done by practice with the use of the knife.

Thrush in Horses' Feet.—The above remedy will cure this disease equally as well and should be used in the same manner.

Ringworm.—It will also cure Ringworm in human flesh, or any parasitic affection anywhere.

Geo. M. Wilber, Marysville, Ohio.

2. Foot Rot.—Pour Turpentine freely into the affected parts. Also mix Turpentine in feed, or in bran and salt, and let sheep have access to same. A quantity of Sulphur added will be of benefit both in sore mouth and sore foot. These seem to be kindred diseases of the blood.

W. R. Jewell, Alkires Mills, West Virginia.

FOUNDER.—I have had four sheep foundered and saved three after they got puffed, and two of them stiff so as to prevent walking. Remedy: Give 2 tablespoonfuls of Castor Oil warmed, or 2 tablespoonfuls of Linseed Oil, and inject the lower bowel full of warm soapsuds. Repeat both the oil and the injection in two hours. I have tried both oils with success.

Geo. H. Banta, Shelbyville, Kentucky, R. F. D. 3.

GADFLY, TO KEEP AWAY.—Rub pine tar on their noses. Keep it on through July and August.

John P. Woodard, New Comerstown, Ohio.

GRUB IN THE HEAD.—Confine sheep in tight stall or pen, place large canvas over pen, then fumigate by burning Sulphur in iron pot. Keep them in until they cough violently.

W. R. Sedberry, Pittsfield, Illinois.

2. Grub in the Head.—Pour into each nostril one-half teaspoonful of Kerosene Oil.

John P. Woodard, New Comerstown, Ohio.

LOSS OF APPETITE.—See STAGGERS OR LOSS OF APPETITE, given by *W. S. Starcher, Berlin, West Virginia.*

MOUTH, SORE.—Hold the sheep's head firmly between the knees, letting it occupy same position as is natural when sheep is standing, and pour Turpentine down over nose and mouth. Also mix a quantity of Turpentine with wheat bran, to which add salt, and feed to the entire flock.

W. R. Jewell, Alkires Mills, West Virginia.

PILES.—Apply clamp and burn off protruding part with a knife-shaped iron which has been heated to a white heat. Then apply Boracic Acid twice a day.

D. TerBush, Fenton, Michigan, R. F. D. 4.

PNEUMONIA OR INFLAMMATION OF THE LUNGS.—Give two to four grains of Quinine in one-half ounce of whiskey every six hours. In one hour after giving the Quinine give:

Saltpeter	2 grains.
Aconite	1 to 3 drops.

Drop the Aconite on the Saltpeter, and put the mixture on the tongue; repeating remedy every four hours until the fever is gone. If the case is very bad, repeat a little oftener.

I never gave this to swine, but should think it would be equally as good for them as for sheep.

G. R. Padelford, Hastings, Michigan.

ROT.—For my sheep I use two-thirds salt and one-third Epsom Salts. I usually keep it lying by them.

I make a dip by boiling tobacco until it is very strong. To every 100 gallons of the juice I add one gallon Carbolic Acid and about twenty pounds of salt. I use a tank that will take a sheep or hog into it and put them under head and ears. My neighbors use a box and dip them back down, but I prefer having them on their feet as I drive them in and lower them out of sight. The dip should be well stirred so as to not have them swallow the Acid.

I have used this same dip for hogs for ten years and have never had any cholera since.

J. M. Hume, Williamstown, Kentucky.

SCAB IN SHEEP.—Mix Wood Soot and Turpentine with their grain when feeding.

John P. Woodard, New Comerstown, Ohio.

STAGGERS, OR LOSS OF APPETITE.—Give 1 tablespoonful of Turpentine. The one dose is usually sufficient, but in severe cases a second dose might become necessary.

W. S. Starcher, Berlin, West Virginia.

TICKS.—To prevent sheep from having ticks, give the salt, sulphur and saltpeter treatment as in cattle. This will prevent scab or any skin diseases and keep the sheep healthy.

George Campbell, Gilchrist, Simcoe Co., Ontario.

2. Ticks and Fluke Worm.—Salt, Sulphur and Ashes, equal parts, to be kept where sheep can eat it at any time. It will keep them in good condition.

W. A. Eastwood, Chesaning, Michigan, R. F. D. 2.

WOMB, EVERSION OF.—I have had several sheep with womb come out which all died until I used the following treatment: Wash the womb gently in warm water and grease well with Sweet Oil or Castor Oil and put back. Then take a common hog ringer and fasten one hog ring through the vagina so the womb cannot come out, and the sheep will fatten for market. I have not lost one since I used this treatment.

George H. Banta, Shelbyville, Kentucky, R. F. D. 3.

WORMS.—Equal parts of Sulphate of Iron and Sulphate of Copper.

Dose.—One drachm for four sheep. Feed in salt, or any way it can be fed best, once or twice a day.

Harmon Rossman, Lakeview, Michigan.

2. Worms in the Head of Sheep, to Prevent.—Put salt in a sharp-bottomed trough and spread tar on each side of the trough. When the sheep eat the salt they get the tar on the nose, and that keeps away the fly that lays the egg which forms the worm in the head.

Robert E. Chambers, Spencer, Indiana.

3. Worms.—Keep salt and Sulphur before them all the time in the proportion of one pound of Sulphur to ten pounds of salt.

I. W. Higgs, Silver Leaf, North Dakota.

4. Worms, Ticks and Other Sheep Parasites.—Simple but effective. To be almost wholly exempt from sheep parasites, keep rock salt in pastures with a few drops of Turpentine put on salt occasionally.

Chas. E. Haynes, Hillsboro, Ohio.

WORMS IN LAMBS.—Take one part Coal Tar Creosote to 99 parts water. After lambs have missed one feed, give as a drench two to four ounces of the mixture, according to size of lamb. Repeat in four or five days if first treatment does not prove effective.

A. L. Fox, New Sharon, Iowa.

2. Worms, Stomach, in Lambs.—Take Gasoline one part to fresh milk four parts and give one tablespoonful twice a day for two days, or until they are better.

The following also I find very good: Creosote of Tar one part to water fifteen parts. One tablespoonful once a day for two days.

There is no disease that stock is subject to that causes greater loss than stomach worms in lambs.

J. W. Higgs, Silver Leaf, North Dakota.

REMEDIES FOR SWINE

HOGS, TO KEEP IN CONDITION.—I have been raising and feeding hogs for twenty-eight years and have made hog raising a close study. At first I had a good many failures. After trying all the paper remedies on hog ailments, I find if a hog gets seriously sick you might as well kill it at once, for if it does not die it will never be thrifty, and is useless as a feeder or producer. I have for the last several years been very successful, and now have no fears of disease among my hogs. My theory is, *prevent instead of cure*. My care and treatment is simple and inexpensive, and is as follows:

Keep the lice off, which can be done with a mixture of coal oil and lard, about equal parts, sprinkled on the hogs about once every thirty days if necessary. Sometimes it is not necessary oftener than every two, three, or four months, but at any rate it is necessary in order to have healthy hogs to keep them free from lice.

The next important thing is to keep their digestion in order. This is easily done by keeping plenty of coal cinders where they can have free access to them.

With these rules strictly adhered to in this latitude, the hog raiser need have no fears.

J. F. Ware, Danville, Kentucky.

2. **Hogs, to Keep in Condition.**—I keep air-slaked lime and salt, equal parts, in a trough in the lot. I think it a good conditioner and disinfectant.

James B. Wehrman, Nelson, Nebraska.

3. **Hogs, To Keep in Condition.**—In summer a good run to grass and plenty of water.

In winter feed Sulphur, soft coal siftings, clover hay and bran. Do not feed swine of any kind very long on clear corn or corn meal. Milk is always good. My method of feed in winter is as follows:

To a 150 to 200 pound shote give a heaping tablespoonful of Sulphur at a time in some kind of ground feed, one in the morning and one in the evening, for a week. Skip a week and give for three or four days, after which give none for about three weeks. Soft coal siftings or charcoal should be fed between meals every alternate day—that is, every other day while the hogs are in confinement and cannot root in the ground—from a half pint to a pint each, according to size of hog. They will eat the coal very readily without mixing anything with it. I feed in the trough the same as I do other feed. If clover hay is handy, feed every other day in place of coal, or one day with hay and one day with coal.

L. D. Arnold, Bergen, New York.

4. **Hogs, To Keep in Condition.**—I feed my hogs all the salt and ashes, mixed, that they care to have. It may be put in boxes or in heaps on the ground. I also give them a little Turpentine—about 1 tablespoonful to a pail of swill. Let them run out where they can have plenty of exercise, and also keep

them from piling up on one another in their sleeping place. Give them all the green corn you wish.

S. W. Powell, Palo, Ogle Co., Illinois.

[P. S.—You may state that one year I lost most of my hogs with cholera (about 80 head). All that I had except 12, which latter had a habit of getting through the wire fence and eating all the green corn they wanted. For this reason I think green corn is good food.—*S. W. P.*]

5. **Hogs, To Keep in Condition.**—Salt and ashes fed once a week, keep my hogs from getting sick. Never had any sick ones.

F. M. Brown, Kiel, Kingfisher Co., Oklahoma.

TO KEEP SWINE IN HEALTH.—As I never have any sick hogs I cannot give any remedies, but will say that my hogs always have free access to all the soft coal they want, and it will surprise anyone who has not fed it to see how much they will consume. Also a box of salt and ashes, mixed, placed where they can eat it is a preventive of worms, which are very detrimental to the health of hogs.

W. A. Eastwood, Chesaning, Michigan, R. F. D. 2.

2. **To Keep Swine in Health.**—Give them all the charcoal they want and they will always be healthy.

One teaspoonful of leaf tobacco twice a week to each hog and you will not have any sick hogs.

Robert E. Chambers, Spencer, Indiana, R. F. D. 1.

SHOTES IN POOR CONDITION.—Wash and scrub thoroughly in very strong soapsuds with a kitchen scrubbing brush, and pull or break out the black teeth. If lousy, mix lard and lamp oil and grease them.

D. F. Pike, Lisbon, Ohio.

PIGS, TROUBLES WITH SUCKING.—In this section of the country a great many farmers lost their little pigs the first week or two after they were farrowed, and I was called upon to investigate for the cause. I found that the sows were fed on strong food, such as barley meal, pea meal and the like, causing the milk to be too strong, and producing indigestion in the little pigs.

To prevent this trouble the sows should be fed lightly for a week or two after farrowing with equal parts bran and middlings or shorts, pouring over the mixture boiling water so as to cook it. Add 1 tablespoonful of Sulphur once a day. This will also prevent what we call "cancer of the tail." If you notice little pigs, you will see that they get sore at the root of the tail, the sore taking the form of a ring at the root of the tail, which later drops off.

To prevent the tail dropping off and to heal the sore take:

Sweet Oil ..... 30 drops.
Carbolic Acid ..... 1 drop.
Mix and apply to the sore spot.

Another new disease in this section is that the pigs will get sore back of the ears; a yellow discharge will come from sores, and it has a very bad odor. To cure this, apply coal oil (kerosene) to the affected part and give the hog a tablespoonful of sulphur once a day.

George Campbell, Gilchrist, Simcoe Co., Ontario.

I give two remedies which I have found to be most valuable to me in my swine raising, one below and one under "Pneumonia."

BACK, WEAK.—For the past two years in this locality young pigs (perhaps 20 per cent. of the total number), show a weakness in the back. For instance, they may be standing still, then suddenly give down in the back until the belly touches the ground; or they may be walking and suddenly duck as though going under a low fence. I have consulted many veterinarians, and thus far have not been able to find one who can classify the disease. It is never fatal so far as I know. It affects pigs of from six weeks to four months old.

Use Spirits of Turpentine, about 1 teaspoonful, pouring it along the back. Usually one application is sufficient, but a second, or possibly a third, may be necessary. It is an absolute cure.

H. T. Morgan, Mt. Morris, Michigan.

BLIND STAGGERS, OR RUN-AROUND.—Pour one tablespoonful of Linseed Oil into each ear.

J. M. Hume, Williamstown, Kentucky.

CHOLERA, TO PREVENT.—Hog raising is my forte, but I use no medicines or stock fodder with the exception of Radway's Scientific Discovery, which is a preventive of Cholera. My hogs seem perfectly healthy—no cough or disease of any kind.

John L. Babcock, Neligh, Nebraska.

2. Cholera.—Some years ago I had a severe attack of Hog Cholera among my hogs. I used the following, with the result that I lost only one hog after commencing its use, although I had a number at the time which could not stand up, and they had previously been dying at the rate of two or three a day.

Lime, unslaked	2 pounds.
Sal-Soda	1 pound.
Tar	½ "
Antimony	½ "
Sulphur	½ "
Poke Root (ground and pulverized)	6 ounces.
May Apple Root " "	6 "
Asafetida	6 "
Saltpeter	6 "

Put the Lime, Poke Root and May Apple Root into 4 gallons of water when boiling and stir well; then put the balance of the ingredients in when cool and stir well again; then put the whole into a barrel of swill or mash. In a severe attack, such as I had, I double the strength by taking twice as much of each. When I commenced using it many of my hogs could not eat mash, and we gave it to them as a drink. I have since given the recipe to others, who have tried it with success.

The above can also be used as a preventive by giving one pailful once a week to eight hogs, or say a quart to a hog.

E. A. Wallace, Winamac, Indiana.

3. Cholera.—An exchange says that every paper in the state should publish the fact that burnt corn is a sure cure for Hog Cholera, and adds: "It was first discovered by a distillery in Peoria, Ill. It was thrown to the hogs to be eaten by them. Before that time a number had been dying each day with cholera, but the disease disappeared immediately." It is so simple a remedy that it can easily be tried.

Harmon Rossman, Lakeview, Michigan.

4. Cholera.—

Arsenic	¼ pound.
Cape Aloes	½ "
Blue Vitriol	¼ "
Black Antimony	1 ounce.

Dose.—One teaspoonful 3 times a day, every other day, to a hog of 100 pounds weight.

Bartley Jost, Alma, Buffalo Co., Wisconsin.

5. Cholera.—As a preventive, mix in the proportion of 2 quarts charcoal to 1 handful salt. Leave it where the hogs can have free access to it. Do this 3 or 4 times a week.

D. TerBush, Fenton, Michigan.

6. Cholera.—I recommend the following not only as a preventive but as a cure for this scourge of swine:

Sulphur	1 pound.
Saltpeter, pulverized	1 "
Madder, pulverized	1 "
Black Antimony, pulverized	½ "
Asafetida	2 ounces.

Mix thoroughly together.

As a preventive.—Mix with the slop twice a week in the proportion of 4 tablespoonfuls to five hogs. If they do not eat it at first, starve them to it. As a cure.—Give in the same proportion once daily.

At least half a dozen farmers have told me they have used the above remedy with most excellent results, claiming that it is the only thing they have ever discovered that will cure Hog Cholera.

D. B. Freeman, Detroit, Michigan.

7. Cholera.—Charcoal and ashes is about the best thing I have ever tried for hog Cholera. *G. C. Luce, Coldwater, Mich.*

8. Cholera.—The following is an unfailing cure for Hog Cholera, and also a preventive of the disease: Give to each hog 1 teaspoonful of White Hellebore in food. One dose is sufficient.

Hiram Graham, Franklin, Pennsylvania, R. F. D. 1, No. 9.

9. **Cholera.**—The following formula is from the Government Veterinarian. I have used this remedy, and while it will not always cure the disease, it is nevertheless a good one.

Wood Charcoal	1 pound.
Sulphur	1 "
Sodium Chloride	2 pounds.
Sodium Bicarbonate	2 "
Sodium Hyposulphate	2 "
Sodium Sulphate	1 pound.
Antimony Sulphide (Black Antimony)	1 "

Mix. Dose, 1 tablespoonful to a 200 pound hog once a day.

A. B. Brown, Alexandria, South Dakota.

10. **Cholera, To Prevent.**—Keep them from sleeping in manure piles and old wet straw stacks. Feed charred corn, salt and sulphur, and you will not have the disease in your hogs.

J. W. Higgs, Silver Leaf, North Dakota.

CONSTIPATION AND LAMENESS CAUSED BY STRONG FEED AND WANT OF EXERCISE.—Feed all the wood ashes and salt they want to eat and give them a chance to exercise. *Ernest Heine, Ellendale, North Dakota.*

COUGH.—A small quantity of Venetian Red put into slop and given to hogs will stop cough. To a hog that weighs 100 pounds, give teaspoonful at a time. If not relieved, repeat the dose in twenty-four hours. To a larger hog, give a larger dose; to a smaller hog a smaller dose.

Gurley Taylor, Booneville, Indiana.

LAMENESS.—See CONSTIPATION AND LAMENESS, given by *Ernest Heine, Ellendale, North Dakota.*

2. **Lameness and Stiffness.**—Give Sulphur 1 to 2 teaspoonfuls and Epsom Salts 1 to 2 teaspoonfuls, according to size of hog, in the regular feed till the bowels move freely. Keep in a dry place. *Thomas Newbgging, Atwood, Perth Co., Canada.*

LICE.—Sprinkle hogs with undiluted coal oil. Use plenty, and repeat in ten or fifteen days.

W. R. Sedberry, Pittsfield, Illinois.

PNEUMONIA.—I have found Turpentine—administered by a metal syringe, which they cannot injure by biting—to be the most satisfactory of any remedy. For a pig of 100 pounds, take a tablespoonful of Turpentine and mix with half a teacupful of milk. Reduce dose and repeat in six hours. If in pain, add 30 drops of Laudanum.

H. T. Morgan, Mt. Morris, Michigan.

RHEUMATISM; ALSO LICE.—Rub well with kerosene oil. It will not take the hair off.

John P. Woodard, New Comerstown, Ohio.

SCOURS IN PIGS.—This is a common and dangerous ailment in young pigs, and is most frequently caused by feeding dam too much rich slop too soon after farrowing. If pigs get Scours, which will soon be noticed by the white excrement and general appearance, take 1 teaspoonful of Copperas, dissolve and put into a little swill for the sow and slack up on the slop feed for sow until pigs get older. If pigs get Scours after weaning, give Copperas to them. One or two doses will cure,

T. M. Hume, Williamston, Kentucky.

2. Scours, To Prevent in Young Pigs.—For each pig give one tablespoonful of air-slaked lime two or three times a week. This is an excellent remedy at all times with feeding hogs. I have pursued the course of slopping my feeding hogs twice a week and making the slop as strong with lime as they will take it in small quantities, so that fifty head would not take more than six or seven pailfuls. I have lost scarcely any hogs by disease, and have been feeding for forty years.

David F. Hoover, Pennville, Jay Co., Indiana.

WORMS (STOMACH) IN HOGS.—

Sulphate of Iron.....	1 drachm
Gentian (ground).....	1 "

Give the above to each full grown hog once a day in feed; to young pigs about half the quantity.

Walter Whitfield, Sr., Pontiac, Michigan, R. F. D. No. 6.

2. Worms.—Give in milk one teaspoonful of Turpentine for each pig twice a week before feeding in the morning. I kept this up for two weeks with good results. Put Turpentine and milk in trough in above proportion.

D. TerBush, Fenton, Michigan.

REMEDIES FOR CHICKENS

CHICKENS, SUGGESTIONS FOR CARE OF.—A very good thing for chickens is a good sized pile of sand and gravel for them to dust and feed in. Cooked meats, also ground bones and cracklings from the butcher's kettle, are good to make hens lay.

S. M. Powell, Polo, Illinois.

CHOLERA.—The following, "Douglas Mixture," is a Cholera cure, and is an excellent tonic to give at any time to prevent disease.

Douglas Mixture.—Dissolve ½ pound of Sulphate of Iron (green copperas) in 1 gallon of water. To another gallon of water add carefully 1 ounce of pure Sulphuric Acid. Mix the two together in a jug and keep it tightly corked.

Dose.—From 1 teaspoonful to 2 tablespoonfuls to a pint of water, according to the severity of the sickness.

D. H. Clifton, De Cliff, Ohio.

2. Cholera.—Soak corn or any grain in kerosene for twelve hours and feed. Repeat three times. Sure cure for Chicken Cholera.

W. I. Reynolds, Pipestone, Minnesota.

3. Cholera.—Mix a tablespoonful of Carbolic Acid in a bucketful of scalded wheat bran and feed.

D. F. Pike, Lisbon, Ohio.

4. Cholera.—

Corn Meal	40 parts.
Black Pepper	1 part.

I feed the above freely at the first signs of Chicken Cholera. It seems to be a good tonic for chickens.

James B. Wehrman, Nelson, Nebraska.

5. **Cholera, to Prevent.**—Give as a drink, equal parts of Alum and Saltpeter dissolved in pure water.

Hiram Graham, Franklin, Pennsylvania, R. F. D. 1, No. 9.

6. **Cholera, to Prevent.**—Grind Salts in drinking water, 1 teaspoonful to a gallon of water.

F. M. Brown, Kiel, Kingfisher Co., Oklahoma.

7. **Cholera.**—Give the sick fowls 1 teaspoonful each of Castor Oil, and follow this with Carbolic Acid in the drinking water—½ teaspoonful of Carbolic Acid to 1 gallon of water. Isolate the sick fowls.

E. C. Wood, Mt. Gilead, Morrow Co., Ohio.

8. **Cholera.**—Dissolve 1 pound Copperas in 2 gallons water and add 2 ounces Sulphuric Acid. Dose: One ounce of the solution in one quart of water once a week.

D. TerBush, Fenton, Michigan.

GAPES, A SURE CURE FOR.—Place the chicken in a tight box, and spread a thin cloth over the box. On this cloth put a handful of air-slaked lime; shake it gently to cause the lime to sift through. The chicken will gape and swallow the lime, and this will kill the worms. Care must be taken to not leave the chicken covered too long or it will suffocate. If used properly, the chicken will surely recover.

James M. Ross, Fairmont, Marion Co., West Virginia.

2. **Gapes.**—For Gapes use crude oil about their feeding troughs and runs. *W. S. Starcher, Berlin, West Virginia.*

LICE.—Take dust from the road and wood ashes, about three times as much of the dust as of the ashes, mix and keep dry for chickens to dust in. *D. F. Pike, Lisbon, Ohio.*

2. **Lice.**—Spray the chicken house twice a month in warm weather with kerosene or coal oil and water in equal parts. It is fine to kill lice.

E. C. Wood, Mt. Gilead, Morrow Co., Ohio.

3. **Lice on Chickens.**—In a dry time gather and sift dry road dust and keep in a dry place where the chickens can get at

it, mixing ashes with it. For instance, take a box about 2 feet square by 1 foot high, and put into it ¼ wood ashes to ¾ dust, mixing them up together. In the fall gather the dust for winter use and store in a dry place. I gathered several bushels last fall.

D. F. Pike, Lisbon, Ohio.

PARASITIC BOWEL DISEASE OF CHICKENS.

"A trouble that kills thousands of young chickens."—Dissolve 20 grains Citrate of Iron in a pint of water. Place this where the chickens may have free access to drinking basins. Repeat every day until relieved of trouble. Used successfully by Mrs. Haynes for years.

Chas. E. Haynes, Hillsboro, Ohio.

ROUP.—Mix lard and Sulphur, make pills and place in their throats. Also grease their heads with coal oil.

W. R. Sedberry, Pittsfield, Illinois.

2. Roup.—Take a chicken and stick head in coal oil over the nostrils until it breathes once. By that time it will have inhaled enough to effect a sure cure.

D. B. Freeman, Detroit, Michigan.

SCALY LEGS.—Mix 1 teaspoonful of kerosene oil with 2 or 3 ounces of lard—or in that proportion—and thoroughly grease the shanks of the afflicted fowls. This will kill the mites that cause the trouble.

D. TerBush, Fenton, Michigan.

2. Scaly Legs.—For Scaly Legs dip the feet in crude oil or blackstrap.

W. S. Starcher, Berlin, West Virginia.

Note.—The foregoing recipes have been collected, and compiled with much care, from many of the most reliable farmers and stock owners, and Dr. Waterman is in no wise responsible for the remedies in this department.

PUBLISHERS.

THE SUGAR BEET

By U. P. HEDRICK
Professor of Horticulture, Michigan State Agricultural College

SOIL FOR SUGAR BEETS.—It is now fairly well settled that the ideal soil for growing sugar beets is a clay loam. Such a soil gives the highest yield and the greatest percentage of sugar. Added to the above advantages are those of a reasonable certainty of a crop and a soil easily worked. Clay loams retain moisture in a dry season and give off the excess water when the rainfall is too great. The sugar beet must have high culture. It is essential, then, that the soil be such that it can be easily prepared and tilled.

Heavy clays, in the main, should be avoided. Not, possibly, from the standpoint of food, but because such land is hard to fit for seeding; in most seasons it cannot be well tilled; and the beets find it difficult to push their way downward in the hard soil. It is almost necessary to subsoil such land. The sugar content, too, of beets grown on clay soils is usually low. Again, heavy clay land is very productive of rough miss-shaped roots. Besides subsoiling, clay lands must be kept supplied with vegetable humus; and in the growing seasons must be well cultivated to preserve moisture and to keep the soil from baking.

True muck lands are seldom desirable for sugar beets. While such lands are fairly productive, often producing extra large crops, yet the sugar content is so low that the crop is unprofitable to growers. Some so-called muck lands have sufficient amount of clay and sand in them to produce beets quite rich enough in sugar; or, a clay subsoil may be near enough to the surface to give the beets a high percentage of sugar. Each individual farm of such soil should be carefully experimented upon with growing beets before a large venture is made.

Sandy soils and sandy loams have several advantages for sugar beet growing, but all these are usually outweighed by two

great disadvantages. These are that such soils will not hold a sufficient supply of moisture in any but a very wet season, and that sands are seldom fertile enough to produce a large crop. The advantages are that such soils produce roots rich in sugar; that the land is easily worked, and that the crop can be harvested with comparative ease.

Whatever the soil, the aim must be to grow medium sized beets rather than very large ones. It has been well demonstrated that beets weighing over three pounds contain a small percentage of sugar. Roots with a weight under one pound are unprofitable to handle, because of greater expense in handling. To avoid excessively large roots sow rather thickly.

SOIL PREPARATION.—Second only to the quality and kind of soil is its preparation. From the nature of the crop it is obvious that one of the first requisites is a deep, mellow root-run. Beets grow straight down and entirely beneath the ground. To secure this deep root-run a soil at all hard, or one having a heavy subsoil close to the surface should be subsoiled, and in any case plowed as deeply as possible. Only thus can one grow properly shaped roots with a high percentage of sugar. Sandy soils and those with a sandy subsoil are better without the subsoiling.

Deep plowing and subsoiling should be done, as a rule, in the fall. Thus the ground has a chance to settle so that it will hold more moisture and hold it longer in the growing season, and the work for the spring is put forward by reason of having the plowing done in the fall. Whatever the time for plowing, it is not well to turn under a large amount of coarse plant roughage. Spring plowing should be done at the earliest time consistent with the fact that wet sodden soil is always injured by being worked. If coarse manure is to be used, by all means plow it under in the fall. In most cases it will be found of advantage to apply coarse manure for humus to the preceding crop.

The harrow and the roller in the spring preparation should at once follow the plow. While it is all essential to have a mellow soil, yet if the porosity be too great the evil effects of drouths are much more marked. Harrow the ground until it is in uniformly good surface tilth. The number of times to harrow depends entirely on the condition of the soil. A few times may

suffice, and on the other hand several times over may not bring the soil into the desired condition. The more nearly the field resembles a garden bed, the greater the chance of success.

INFLUENCE OF PREVIOUS CROPS.—The previous cropping of a piece of land has a decided influence upon the growth and quality of sugar beets. Undoubtedly the most desirable crops to precede sugar beets are some of the garden-like plants now so commonly grown in sugar beet regions. A previous crop of cucumbers or of tomatoes leaves the ground in good condition for beets. Beans followed by beets is a good rotation. Heavy sods leave land in poor condition for beets, as do all crops which make necessary the plowing under of much coarse vegetation. For this reason, corn stubble land is not the best, though the stubble of the grain crops often gives good results. Beets followed by beets is often undesirable, because diseases have a better chance at the after crops: Many growers, however, sow beets two and three times in succession without decidedly evil effects from fungi and insects of the previous crops.

SEEDS AND VARIETIES.—Beet seeds are usually, if not always, furnished growers by the sugar company. This is a requirement in most contracts. It is well for the grower and the factory alike that such is the case. The seed is imported from Europe by the sugar companies and is usually well tested before distribution to the grower. Thus certainty of growth and of the proper variety is insured. The cost to the grower is much less than if he were compelled to buy in small lots from seedsmen. Probably it will come about that our seed will be American grown and of improved varieties for our conditions, but it will be long before the average grower can secure seeds of as high a quality as those that can be furnished from the factory. Not less than a score of varieties of sugar beets have been tested in the Michigan growing regions. Without doubt some are better adapted to certain regions than others. Within the opportunities given him by the factory, the grower should test the varieties to be had to ascertain which suits his conditions most advantageously.

SOWING THE SEED.—The notion prevails that seed sowing is a difficult and expensive operation. This is wrong and

the reverse of the truth, for the seeding is about the simplest of the beet growing operations Ordinary garden seed drills of some makes may be used in sowing small plats, but the special sugar beet drills will soon pay for themselves in a field of more than a few acres. Grain drills are never satisfactory without beet seed attachments, and are seldom satisfactory with these. Cultivation is facilitated somewhat if the same number of rows are drilled at one passing as will be cultivated at a single passing of the cultivator. To illustrate, do not follow a three row drill with a two row cultivator.

It is false economy to be sparing in the amount of seed for the beet field. On the other hand it is often profitable to be somewhat prodigal of seed—far better to err on the side of too much rather than on that of too little seed. If all of the seeds could be placed just where each is wanted; or if all would grow, a very few pounds per acre would suffice. Experience, however, has well demonstrated that not less than fifteen pounds should be planted, and in many cases this amount can be increased a few pounds. The soil, the season and the condition of the field have much to do with the amount of seed.

The time for planting has been a matter of much experimentation. Happily it has been decided that there can be considerable range as to time. In the latitude of Michigan, planting may begin April fifteenth in the average season and continue until the first of June. The ideal time is from the tenth to the twentieth of May. If a large area is being planted several dates for planting may be advisable to give a longer period for thinning, cultivating and harvesting.

The depth to plant depends, of course, upon local conditions. The lighter the soil and the later the seeding, the deeper the seed should be planted. The distance apart of the rows is likewise dependent upon individual conditions. The poorer the soil, the greater the distance between rows. The limits as to the distance are from eighteen to twenty-four inches with twenty-one, the average, as the best distance for most conditions. The beet tops must cover the ground.

THINNING.—The operation of thinning is about the most important one connected with the growing of sugar beets. It is

the one, too, that is most often neglected in that it comes at a busy time of the season, and in that it is a tedious operation and must be done with exceeding care if done well. The time for thinning should be guaged by the growth of the young plants rather than by number of days. Thus we say begin to thin when the fourth leaf begins to show. Usually this will be a month or a little less, depending upon conditions, after the completion of seeding. The rule for thinning is that there shall be but one beet for each six or eight inches of row. For most part the thinning must be done by hand. If used with skill and judgment, a hoe greatly aids in the work of thinning, but implements must not be put in the hands of the unskilled. Thinning is usually performed by gangs of women and children under the charge of expert foremen. Thinning should be done promptly and expeditiously, as any delay increases the expense of the operation and retards the crop.

CULTIVATION AND WEEDS.—Cultivation in the beet field serves four chief ends. First, it saves the moisture. By forming an earth mulch on the soil surface evaporation is prevented and the moisture is conserved for the use of the plant. Second, it sets free plant food by breaking up clods and hard spots, and by permitting the freer entrance of air. The action of the elements, too, on the mellowed soil makes available plant food, which otherwise the plant could not have used. Third, it enables the roots to obtain a full supply of Oxygen. Plants, like animals, must have Oxygen, and the more porous the soil the more freely the air can circulate. Fourth, cultivation kills weeds. In the care of beets the last is probably the chief end of cultivation, as a crop of weeds unchecked is fatal to the beet crop.

Cultivation to kill weeds should begin before seeding. When seed are to be put in toward the middle of May or a little later, the soil should be cultivated several times before sowing, that all sprouting weeds are killed as they show themselves. Cultivate up to the day before the seeds are sown. Some prefer extra early planting, thus giving the beets equal chance with the weeds, with the intention of cultivating as soon as the beets appear. Whatever the treatment to get ahead of weeds, it is a safe procedure to start the horse cultivator as soon as the rows of

beets can be seen and keep it going once a week until the beet tops cover the ground. Once the leaves entirely cover the ground, the weeds will grow no more. It is well to keep in mind that the greatest growth of the beet is made, and that most of the sugar is formed after the leaves have covered the ground.

BEET PULLING.—Beets begin to form sugar and to mature early in October. The beginning of the ripening period is indicated by the leaves, which at this time turn yellow. More accurately the period for harvesting can be determined by a chemical analysis, the general average for unripe, immature beets being below the 12 per cent. standard. Fully mature beets should exceed the standard just given, the amount of excess depending upon the soil and the season. Happily the harvesting period can be prolonged six weeks to suit the convenience of grower or of buyer. It is estimated that about one-fourth of the expense of growing beets comes in the harvesting. It is obvious that the grower must not neglect nor put off so important an operation until the cold and wet of autumn entirely prohibit out-of-door work.

In the latter connection it is important to note that sugar beets may be frozen to almost any degree without injury if used before they are thawed. Repeated freezing and thawing before conversion into sugar, however, spoils the product.

Several special tools are used to lift the beets out of the ground. Without doubt a special tool for the purpose is better than the subsoil plow, or the common plow, often seen in the beet field. The kind of special tool depends largely upon the soil. No device yet invented can be successfully used in wholly removing tops from sugar beets. For most part topping is done by hand, using a special knife for the purpose. Here again women, and boys well along in their teens, can be employed in well managed gangs to advantage. The crop is easiest picked and carted to cars and factory in bushel slat crates, now to be had in almost every neighborhood.

We have followed through the essential phases of sugar beet growing from soil to harvesting. There are still, however, several important considerations that need attention if one contemplates growing beets. The first of these is the contract.

THE CONTRACT.—Nearly all sugar beets are grown under contract. These are made between the agents of the company and the grower during the winter campaign preceding the growing season. Dear experience has taught farmers to beware of contracts as a rule, but the beet sugar industry is such that the contract is an essential for the farmer and factory. On the part of the farmer he must know that he can dispose of his crop to the factory, otherwise they are almost a dead loss. The factory must be sure of a definite acreage and that the product of its seed goes to no other factory. The chief things specified in a contract are: Acreage, a stipulated price determined by the purity of beets and the percentage of sugar; the regulation of matters pertaining to seeds; and the penalties. The latter are such that they can be inflicted only through the claim arising from the factory's having furnished the seed. Sugar beet contracts may be characterized in the main as fair and just.

LABOR.—The growing of sugar beets requires more labor than can be found in most farming communities. To secure labor it is almost necessary that the beets be grown near a town or city. Fortunately cheap and unskilled labor largely suffices. It must be such, however, that it can be concentrated. Gangs of workmen are absolutely necessary at certain periods. Near towns women, boys and girls in their teens, and unemployed men can be secured without trouble. Special inducements in the way of a meal, or in the way of a free ride night and morning, go a long way toward securing help. The crop is such, for most part, that high wages cannot be paid. A skilled, active foreman or two is a necessity with such labor. It is obvious that the acreage of beets a man can grow must be largely dependent on the laborers he can secure.

FERTILIZERS FOR BEETS.—Sugar beets are heavy feeders and quickly exhaust land. The problem of supplying soil fertility at once confronts the man who expects to grow beets regularly. Unlike most phases of general farming, there is little or nothing to be returned to the land from the refuse of the crop, and the grower must look almost wholly to outside sources for fertilizers.

It has been found that barnyard manures are not ideal fertilizers in sugar beet growing unless applied the season previous, and in no case later than the previous autumn. Sugar beets grown in a soil containing manure not well rotted, as is the case when the manure is applied in the spring, are usually miss-shaped and lacking in sugar. Even well rotted stable manure is best applied the fall previous, that it may become thoroughly incorporated in the soil.

Commercial fertilizers are quite generally coming into use. Just what fertilizers can be best applied depends largely upon the food elements in a soil and upon the texture and condition of the soil. Of the various special brands of fertilizers on the market, manifestly those for root crops are better for beets than the grain fertilizers. As a rule, fertilizers rich in Potash and Phosphoric Acid are wanted for beets, as these elements increase both tonnage and quality. Nitrogen is not so much needed, except to give the young plants a start. In the main, fertilizers for beets should be quickly available, and with the exception of Nitrate of Soda, possibly, should be sown broadcast before seeding and thoroughly mixed with the soil. It has been found that a ton of unleached wood ashes and 100 pounds of Nitrate of Soda per acre on the average soil is a good formula. Another acre formula is:—120 pounds Nitrate of Soda, 250 pounds Acid Phosphate, or of dissolved bone; and 125 pounds Sulphate of Potash.

TOOLS.—The plows and harrows for this crop may be those in common use. The only suggestion in regard to them is that they should be adapted for the soil in which they are to be used. Each kind of soil, in general, has a plow and harrow best adapted for it. Many, many acres of sugar beets are grown without special seed drills or special tools for lifting. Nevertheless, the man who is growing any considerable acreage will find it greatly to his profit to provide himself with a beet seed drill, sugar beet cultivators, beet weeders, special hoes, topping knives and the beet lifter. The total expense for these implements is not great, and need not exceed $80.00 or $100.00, depending upon the sizes purchased. Some factories furnish tools at wholesale prices; others rent tools to their growers. In some neighborhoods

tools are owned in partnership by two or more growers. It is obvious that the more expensive and the scarcer labor is, the greater is the need of having a thorough equipment of the best sugar beet tools.

HIGH QUALITY.—A most important point in the growing of sugar beets is to secure a high quality—that is, a large sugar content and a high degree of purity. In this the sugar beet differs much from most other crops, the chief requirement in the growing of which is productiveness, regardless of quality. The selection of the soil and the management of the crop, then, must always be such that they are conducive to high quality, with tonnage as a secondary consideration.

FERTILIZERS

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Fertilizers are materials which render a soil more productive or more fertile. The most common examples are: Stable Manure, Guano, Nitrate of Soda and Land Plaster. The question at once arises, what substances can be added to make ground more fruitful? This cannot be answered without ascertaining what materials are present in a soil that is called rich or fertile.

ELEMENTS NEEDED IN PLANT GROWTH.—In order to determine the latter point many chemical analyses of plants and soils extending over a great number of years have been made. The results of these analyses have enabled scientists to divide the substances necessary to the nourishment of plants into three groups: First, those absolutely necessary to plant growth which must always be present and in such form that plants can make use of them. These are: Oxygen, Hydrogen, Carbon, Nitrogen, Phosphorus, Potassium, Sulphur, Calcium (Lime) Magnesium and Iron. Second, there are some substances which are present in all plants, but do not seem to be indispensable to growth: as Chloride, Sodium and Silica. Third, there are always admixtures depending upon the soil, as Aluminum, Zinc, Copper, Nickel and others.

What is the remedy if any of the necessary substances are wanting in the soil? Obviously, it is to add the missing element or elements in some available form. This is called fertilizing. Happily, many of the substances necessary for plant growth are always found in sufficient quantities in soil or atmosphere, and the plant grower needs to add but comparatively few. The elements that are commonly lacking, and which must be added as fertilizers of one kind or another, are: Nitrogen, Potassium and Phosphorus.

Having determined what substances are likely to be wanting in a soil, we must ask, In what form does the plant find these substances in the soil?

But before this question can be answered a knowledge of what the soil is, is necessary. Soil consists of finely divided rock fragments mixed with decayed vegetable and animal matter. Now, the structure of the soil has much to do with soil fertility. By structure is meant the size and character of the rock fragments composing a soil. Thus we may have gravel, coarse sand, fine sand, clay, silt, etc. The structure of the soil is intimately connected with the fertility because upon the structure depends the amount of air circulating in a soil; the amount of water held for the plant; and the possibility of favorable decomposition of fertilizers added.

The best structure for a cultivated soil is one which is not too coarse to hold sufficient water for plant growth, and yet is not so fine that it retains so much water that the soil is saturated, thereby excluding air.

The practice of fertilizing soils is made possible by the capacity of all soils to attract and retain the substances which plants take from the earth. The capacity of a soil to retain the various elements of fertilization is known as its power of absorption. Now, a plant takes in through its roots not only the water held in the soil, but also the substances absorbed by the water.

We are now ready for the question as to the form in which plant food exists in the soil. In this connection we need to discuss only the three foods as given above.

Potassium is absorbed and held by soil for the use of plants in the form of some one of several Potash Salts, as the Sulphate, Chloride, or Nitrate. All of these are somewhat of the nature of common salt. All may be purchased as chemical fertilizers, although the last named is too expensive for common use. The above salts may also be added to land in combination with other elements, as in the case of ashes and stable manure.

Phosphorus is available to plants only as Phosphoric Acid. As such it may be absorbed by the soil if it enters in solution, where it combines with some of the metals. The best condition of this acid is, as it is combined with Lime, Magnesium or Iron,

making the so-called Phosphates sold as commercial fertilizers. Usually, the richer a soil is in Lime, the more Phosphoric Acid it will absorb and retain for the use of plants.

Nitrogen, the third important element, is about us in the air everywhere, but is not available for plants except in the case of the so-called leguminous plants—peas, beans, clovers and their like, which have the power of taking nitrogen in through their roots by the aid of bacteria in minute root tubercles, which all must know. Plants make use of Nitrogen chiefly as Ammonia, and in salts known as Nitrates. Very little of the Nitrogen in these compounds is derived from the air, and we may say that practically all of this element must come from fertilizers except that taken from the air by the clover-like plants.

REPLENISHING PLANT FOOD.—How can we replace plant foods in the soil? For it must be apparent to all that no soil can endure loss of foods year after year without being replenished. As well expect a man to continue to draw from his bank account without ever adding thereto.

Hydrogen, Oxygen and Carbon are replaced by natural processes; as by means of water and from the air. Lime is found in sufficient quantities in most soils and is easily added to those lacking it. Iron and other mineral elements are always present in sufficient quantities. We need, then, to add but the three chief elements—Potassium, Phosphoric Acid and Nitrogen. These may be added in many forms, as we have seen above, which, however, fall into two great groups—inorganic or mineral fertilizers, and organic or vegetable and animal fertilizers.

INORGANIC FERTILIZERS.—The soil can be replenished with all the plant foods in the form of chemicals. These have the advantage of being concentrated, easily applied, and of having the amount and value of each element in them definitely known. Besides furnishing food to plants, chemical fertilizers have a mechanical action on soils, making them in most instances more compact and more retentive of moisture. They also have an indirect effect in furnishing food, inasmuch as most of them help to set free plant nourishment already in the soil, but not available to plants because not in the right chemical form.

POTASH COMPOUNDS.—The chief source of inorganic Potash fertilizers are certain salts mined in Germany, of which Commercial Kainit is an example. These salts are found on the market under the name just given and as Sulphate of Potash and Muriate of Potash. The salts of Potash are very concentrated, and it is seldom advisable to apply them in the hill or in the row with seeds or plants, nor immediately before the planting of seeds or the setting out of plants. Serious injury is often done tender seedlings by the injudicious use of Potash salts. They are best applied at a considerable time before planting. The quantities vary greatly, depending on the crops, the soil, and the value of the fertilizer. Recommendations as to the amounts to be used for the different crops are usually furnished by the experiment stations or by the sellers of fertilizers.

Whichever of these salts is used, it should be mixed in the soil and not placed on top, and at a time when a damp period is likely to follow. A choice of the three named depends on the crop. Kainit is the cheapest but is less concentrated, and the distance from the sea coast, upon which the price largely depends, because of transportation charges, may make it the most expensive. The Muriate of Potash is usually most quickly available, therefore best for early crops and for use when an immediate effect is wanted.

Wood ashes are a most valuable source of Potash and at one time furnished the entire supply of this element. A drawback to the use of ashes is that the product is not uniform, that from different woods varying much. Usually the softer the wood the poorer the ash. Ashes should always be bought subject to analysis, paying so much per pound for the food constituents. The value of unleached hardwood ashes ranges from twenty to thirty cents per bushel. They can usually be purchased for much less. Coal ashes have no value. Ashes have a very favorable effect upon the soil structures of light soils, making them more compact. The very great value of ashes is seldom realized by those who use fertilizers.

PHOSPHORIC ACID COMPOUNDS. — Phosphoric Acid is also obtained in several forms as an inorganic fertilizer. The chief source is the various rock Phosphates mined in several

parts of the United States. These contain from 18 to 30 per cent. Phosphoric Acid. All are fairly uniform in character, easily handled, and for most part are highly satisfactory Phosphate fertilizers. The chief drawback is that they are not very soluble, and not therefore quickly available as plant food. All dealers in commercial fertilizers handle them.

Iron Phosphate, or the Thomas-slag, is a waste product in the manufacture of steel. It is produced in large quantities in steel making countries, and its production is increasing. It contains from 15 to 20 per cent. Phosphoric Acid and comes in the form of a fine powder. Like the Rock Phosphate, it is somewhat insoluble and not quickly available.

The Rock and Iron Phosphates are usually considered "raw material," of little use to plants without some preparatory treatment to make them more soluble and so more available for the use of plants.

Usually they are made more soluble by treatment with an acid, which changes them into the so-called acid-phosphates. We shall not have further occasion to mention the acid-phosphates, and must here call attention to their great desirability as a means of furnishing Phosphoric Acid. Rock and Iron Phosphates may go through the change of decomposition in the soil, in which case they must be added long before it is expected the plants will need them. In the latter case, the plants make use of the Phosphoric Acid as rapidly as it becomes soluble. The rate at which the above phosphates become soluble, and thus fit for plant food, depends upon the fertilizer itself; the fineness of division of the fertilizer, the character of the soil, and the kind of crop.

NITROGEN COMPOUNDS.—Of the three food elements we are discussing, Nitrogen is the most expensive and the most useful in the various systems of fertilizing. It is obtained for most part from barnyard manures, and yet large quantities come from two chemical fertilizers—Nitrate of Soda and Sulphate of Ammonia.

Vast deposits of Nitrate of Soda are found along the Pacific coast of South America. As this fertilizer comes to us it contains from 15 to 16 per cent. of Nitrogen. From the standpoint of

availability as a food for plants, this must be regarded as the most desirable form of Nitrogen. Plants can make use of it at once; it is in concentrated form, and since it is readily soluble it distributes itself well throughout a soil.

Sulphate of Ammonia is a salt derived from the manufacture of gas and coke from coal. It contains about 20 per cent. Its advantages are that it is very concentrated, thus reducing the cost of handling. It is stable and always in the same form, so that the purchaser knows what he is buying; and it is soluble and therefore quick in its effects on plants.

The difference in usefulness between these two Nitrogen fertilizers depends most largely upon the character of the season. The Sulphate of Ammonia is most useful in a wet season, as the Nitrate of Soda dissolves rapidly and is washed out and lost if there is much water in the soil. On the other hand the Nitrate of Soda is the most useful for a dry season. Both possess advantages over organic forms of Nitrogen fertilizers, in that they are definite compounds, always alike in their appearance, and always behave in the same way.

ORGANIC FERTILIZERS.—Originally organic fertilizers in the form of animal manures were the only fertilizers added to the soil. Notwithstanding the evident value of inorganic food substances, and notwithstanding the fact that they are indispensable to any rational system of agriculture, animal manures still hold first place as fertilizers. The good husbandman, whatever the crop he grows, still aims to get as much organic fertilizer as possible, and then supplements it with inorganic fertilizers.

The greatest advantage of organic compounds over inorganic ones for enriching lands is that the former improves the physical conditions of all soils, while the latter, though it may benefit some soils temporarily, invariably causes the soil to deteriorate in structure if applied solely for more than a few years. Moreover, inorganic fertilizers for most part lose their valuable qualities after several applications, if not carefully rotated with barnyard fertilizers or green manure crops.

STABLE MANURES.—The chief aim in adding fertilizers to the soil is to increase the plant food in the soil. This is

recognized by all, but there is a second end now considered almost equally important; namely, to improve the physical condition of the soil. Barnyard manures are ideal in that they serve both purposes to a high degree. Thus heavy soils are made more fertile and yet lighter and more porous in physical condition by the addition of manures which contain more straw, while light soils are enriched and made more compact by adding manures lacking in straw or those that are well rotted.

The disadvantages of farmyard manures are: that the fertilizing elements in them are seldom in good proportion; they have much Nitrogen but lack Potash and Phosphoric Acid; they are bulky and therefore expensive to handle. It often pays to buy chemical fertilizers rather than to accept inferior barnyard manures as a gift and distribute them. Third, one can seldom determine the true value of such manures, some being much more desirable than others. Lastly, the food substances in them are not in quickly available form, and excessive amounts must be applied to obtain immediate effects. While such manures are indispensable, plant growers now recognize that used alone they are inadequate.

Farmyard manures, including the dung of all farm animals and poultry, are used almost entirely as sources of Nitrogen, though all contain the other two food elements in varying degrees.

Their application to the soil should generally precede planting by several months, unless extremely well rotted. The practice of hauling manures at once to the fields as they are made in the stable is rightly growing in favor. Depending upon the crop, manures are added at the rate of from 10 to 50 tons per acre.

OTHER ORGANIC SOURCES OF NITROGEN.—Slaughtering establishments furnish several valuable products rich in Nitrogen. Chief of these is dried blood, which is the most concentrated and richest of the Nitrogenous fertilizers. It decays very rapidly in the soil and is quickly available as a plant food. It contains from 13 to 14 per cent. of Nitrogen. Dried meat obtained from the same source is similarly desirable. Hoof-meal is another high grade product from slaughtered animals. Tankage, which contains such waste matters as hairs, bones, tendons, and all unsalable parts of slaughtered animals, is more

common than any of the above, but is not so desirable because not so uniform nor of so high a grade. Tankage usually contains considerable Phosphoric Acid and some Potash as well as the Nitrogen. All of these are commercial fertilizers, and can be obtained at reasonable prices from dealers.

The guanos, bird manures, obtained for most part from Peru, were at one time a large and valuable source of Nitrogen. But these can scarcely be considered now owing to the fact that the supply is nearly exhausted; but where obtained at a reasonable price they are very desirable, mostly for their Nitrogen, but somewhat for the other two elements as well.

ORGANIC SOURCES OF PHOSPHORIC ACID.—The chief of all sources of Phosphoric Acid are the bones of various animals. For a long time bones were the only source of this fertilizer. The form in which the compound is found in the bones is that of Phosphate of Lime. In nearly all bone fertilizers there is also some Nitrogen, but there is little or no Potash. Bone fertilizers are found in our markets in various forms, chief of which is raw ground bone.

Raw bone is that which has not lost any of its original constituents. For this reason it is highly esteemed as a fertilizer. It contains about 22 per cent. of phosphoric Acid and 4 per cent. of Nitrogen. Applied to the soil in this state, considerable time elapses before it decomposes and becomes available. Hence it should be used some time before the plants need it, and should always be ground as fine as possible. "Bone Meal," "Bone Dust" and "Fine Bone," as sold by the trade are all raw bone.

Most of the bone sold for fertilizers has been cooked or steamed to secure the fat, which is valuable for other purposes. This deprives the bone of much of the Nitrogen, but makes a somewhat better source of Phosphoric Acid, as this element becomes more available through the cooking. Probably this is the most desirable form in which to purchase bone fertilizers, other things being equal.

Bone black or animal charcoal is another valuable source of Phosphoric Acid. This material is much used in the arts, especially for clarifying sugar. But after it has served its purpose in the arts, or because of the impurities it gathers, it becomes a

high grade fertilizer. It must be said, however, that it is now so valuable for manufacturing purposes that it is not much used as a fertilizer. Inasmuch as it decomposes very slowly, it is scarcely as desirable, as the other forms of bone.

In concluding the matter of organic fertilizers, a great number of other substances might be discussed, nearly all of which are most valuable for their Nitrogen. A fair percentage are sought for their Phosphoric Acid and a very few are applied for their Potash. Among the less well-known organic substances are: garbage, tankage, various forms of fish, wool, leather and hair, cottonseed and linseed meal, castor pomace; tobacco stems which are valuable as an organic source of Potash; muck and peat and along the ocean, seaweeds of different kinds.

GREEN MANURES.—A great deal might be said concerning the value and the place of green manures. The term is applied to any crop which is grown primarily to enrich the soil and not for a product to be harvested. For most part these are Nitrogen gatherers and add Nitrogen to a soil, though a few are Nitrogen consumers and take surplus Nitrogen from the soil.

The most useful of green manures that add Nitrogen to the soil are those that belong to the clover family, as: the red and crimson clovers, cow peas and soja beans. These accumulate Nitrogen from the air, and at the proper time are plowed under, adding the element to the soil. It is easy to see that it would be injudicious to long continue the use of green manures as the soil will gradually become too rich in Nitrogen. Artificial manures must be rotated with the green manures.

BUYING FERTILIZERS.—Dear experience has taught most users of commercial fertilizers that the best fertilizers to buy are the unmixed fertilizing materials rather than special mixtures, or the so-called standard brands. The unmixed fertilizers are cheaper, more stable and reliable, and the practice in general, of applying single constituents is a better one than that of using special formula for this and that crop. The buyer should seek to purchase a certain definite number of pounds of plant food, rather than a mixture supposed to possess remarkable qualities of the patent medicine order.

THE USE OF FERTILIZERS.—There are many, many factors which govern the profitable use of fertilizers Much of the farmyard manure is wasted through injudicious methods of using, and money for commercial fertilizers seldom goes as far as it should because of a lack of knowledge in using the fertilizer. Is the application made for the immediate crop or for a large yield from a number of crops? What food is needed by the soil? What was the previous cropping? Am I practicing a system of rotation of fertilizers? What food element does the crop in hand demand? These are some of the questions a grower of plants must have answered for him in the use of fertilizers.

SOIL AS A GUIDE TO THE FERTILIZER NEEDED.—A wide difference exists in the chemical composition of soils. As would be expected, in the application of fertilizers, much can be told by the character of the soil. Thus, Potash is usually the most needed constituent for a sandy soil. On the other hand clay soils are well supplied with Potash, but as a rule lack Phosphoric Acid and Lime. In a limestone soil, Phosphoric Acid is very likely present in sufficient quantities; Potash is also usually present, but Nitrogen is generally lacking in sufficient quantities. But it must not be thought that the soil is a perfect guide. Soils of the same kind vary widely as to fertilizers needed, and the above statement must be taken in a very general way.

PREVIOUS CROPS AS A GUIDE FOR FERTILIZERS.—The growing of crops for several years in succession is bound to rob the soil of the food element demanded by that crop. Thus, continuous cropping with wheat removes a larger proportion of Phosphoric Acid than of the other elements, and the soil becomes deficient in this food. Timothy hay would remove more of the Potash than of the two other elements. Corn would take a relatively large amount of Nitrogen. As with these, so with all crops, each taking more of one food element than of the others. When an attempt is made to bring land to a richer degree of productiveness, and to equalize the proportion of plant foods, previous cropping must always be considered. In the above statements are found reasons for a rotation of crops. By rotating crops, nearly equal quantities of the plant food may be taken

from the soil, and if the rotation includes such fertilizing crops as clover, the lands suffer the least possible from cropping. A rational, economical system of fertilization goes hand in hand with a well thought out system of rotation.

THE KIND OF PLANT AS A GUIDE.—Perhaps the best guide, as taken alone, as to the kind of fertilizer to be added to the land, is the kind of plant to be grown on the land. Thus, the grains require much more Phosphoric Acid. But because of their great extent of root system, and the structure of their roots, they are able to get a larger per cent. of Phosphoric Acid and Potash from the soil than can most plants. On the other hand, they need much Nitrogen early in the season to insure proper plant growth. The cereals, therefore, require a well balanced ration of plant food. Grasses and all plants grown as forage crops need much Nitrogen, since the leaves and stems contain large amounts of this element. The clovers, also largely grown for their foliage, it must be remembered, take Nitrogen from the air and hence need but little in the soil. The clovers need liberal applications of Phosphoric Acid and Potash with no Nitrogen.

FRUIT CROPS.—Fruit trees and plants differ chiefly from farm crops in that a much longer period of growth is required before the product of the plant appears. Several years elapse from setting to bearing. Fruit crops should be provided with food compounds that will give a slow and continuous growth rather than a rapid one. It can hardly be said which of the elements is most necessary—all should be found in abundance. There must be no dearth of Potash, while too much Nitrogen may do serious damage by stimulating leaf and wood growth at the expense of the fruit.

VEGETABLE AND ROOT CROPS.—The vegetable and root crops for most part are grown rapidly to insure high quality and tender tissues. In order to accomplish this end they must be supplied with an abundance of plant food that is quickly available. Nitrogen is the great promoter of leaf and stem growth, and is absolutely necessary in large quantities for this

class of plants. It can be best supplied by the use of well rotted stable manures applied at plowing time, or Nitrate of Soda applied to the growing plants in several top dressings.

CHEMICAL ANALYSIS AS A GUIDE.—There is an all to common notion that a system of fertilizing can be based upon a chemical analysis of soils to show what elements are lacking. Such analysis serve as indications, but are never to be taken as absolute guides, and are of no more value in indicating a proper system than are the factors hitherto discussed. The best guide by far is direct experimentation by the farmer himself. Neither the scientist nor the experiment station worker can give detailed or absolute advice for a farm not directly under his charge. Each farm has conditions peculiar to itself. Each crop needs fertilizing peculiar to itself. A system of fertilization, then, must be worked out by the farmer himself. The only absolute statement that can be made is that the most unsatisfactory and the most expensive method of soil fertilization is the "hit or miss" system quite too generally practiced.

SPRAYING

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Spraying is the art of applying extremely fine particles of liquid or dust to cultivated plants in such a way that the plants are protected from injurious insects and fungi. The practice is a comparatively new one, and it is worth while making inquiries as to why it became necessary, and as to whether the necessity will continue.

Spraying has become necessary within the last quarter of a century because of the changes in the relationship between fungi and insects and cultivated plants. Chief of these changes are: Native plants have been destroyed in many localities, and insects and fungi have been driven from the woods and wilds to feed upon the crops of the field, garden and orchard. Again, before the advent of fast steamships, insects and fungi could not live through the long ocean voyage, and but few were introduced from foreign countries. Now, in our commerce, we bring pests from all parts of the world, some of which have become our very worst enemies. A third reason is that pests have been breeding in neglected orchards and gardens for a century, and now come forth in countless numbers. Lastly, our methods of cultivating plants have changed. Formerly we grew crops of all kinds in small and isolated fields. Now farm joins farm and the fields are immeasurably larger than they were a generation ago. It is easier under present conditions for pests to get from farm to farm, and once a foothold is gained they spread more rapidly in the large fields, just as smallpox sweeps through the city with greater virulency than in the country.

Thus we can largely account for the great number of kinds and number of individuals of insects and diseases now here.

There are no reasons why they will not continue a menace to the products of the soil and why they will not be re-inforced by newcomers in the future. Spraying, then, is an established orchard and garden operation, and every successful grower of vegetables and fruits must come to practice it.

The troubles for which the grower of plants must spray may be classified under three general heads:

First—Insects. These injure plants in two ways. They may eat parts of plants, as do the caterpillars, beetles and borers; or they may use their beaks to suck the juice from plants, as do plant lice, scale insects, true bugs and their like. Depredators of the first class are killed by applications of poisons with their food. Sucking insects do not take poisons with their juicy food, and must be killed by destroying their external parts with some caustic solution, as lye, kerosene, or whale oil soap. Another class of insecticides kills insects of both kinds by filling up the breathing pores, thus smothering them; such substances are Buhach Powder, Tobacco, Sulphur and Lime. Both types are sometimes repelled by noxious materials as Tar, Carbolic Acid and fish soaps. Some insects may be trapped, or picked by hand, or burned with various devices, or scalded with water, or caught in sticky substances. Many remedies have combined in them several of the above principles.

Second—Fungi. Fungi are plants just as truly as are the cultivated crops we treat in spraying. They differ chiefly from common plants in that they bear no flowers and have no green coloring matter in their organs. They feed on living and dead organic matter. Rusts, mildews and smuts grow on live organic matter, while toadstools, puff balls and molds get their food from dead matter. We are concerned with the former and their like for the most part.

Parasitic fungi, those living on growing plants, are characterized by definite spots, discolorations or excrescences scattered over the leaf, fruit or branch. Common parasitic fungi are apple-scab, black-knot of the plum and cherry, and the leaf-blight of the pear. After a fungus gets into the tissue of a plant it is almost impossible to kill it without injuring the plant. Treatment, therefore, is preventive rather than remedial. To prevent

fungi from gaining a foothold on plants we cover the parts exposed with a thin film of some substance which kills the spores (the reproductive bodies corresponding to seeds) of the fungi.

Third—**Bacteria.** Bacteria are small organisms consisting of one or several round, rod-shaped, or cork-screw like cells. They have no green coloring matter and are either refuse-eaters or parasites on plants or animals. They are found everywhere in air and water, and are the cause of most of the contagious and infectious diseases of mankind, animals and plants, as smallpox, anthrax, pear-blight and probably peach-yellows. The difference in appearance between the bacterial and fungus troubles of plants is chiefly in that the former are not localized in definite spots, but sooner or later the entire plant shows disease. There are no specific remedies or preventives for the bacterial diseases of plants. The plant grower can practice the same kind and degree of sanitation practiced with similar troubles of mankind. Thus, all diseased plants should be removed and destroyed and all conditions which favor the development of bacteria should be avoided.

The number of specific kinds of insects, fungi and bacteria loosely classified above are almost beyond the computation of man. To describe even the most important of them is more than could be attempted in this treatise. Happily the same sprays, applied as the life habits of the pests dictate, may be used for the most part on insects and fungi which fall in the same general classes. The following are concise directions for making and applying those sprays which the accumulated experience of plant growers the country over have found most effective.

INSECTICIDES.—The chief insecticides, spraying substances which kill insects, are: For insects that chew, Paris Green, White Arsenic and Hellebore; for those that suck the juices of plants, Kerosene Emulsion, Lime, Salt and Sulphur, Tobacco and Whale Oil Soap. Pyrethum, or Buhach, is valuable against both chewing and sucking insects.

Paris Green.—

Unslaked Lime	2 pounds.
Paris Green	1 pound.
Water	150–200 gallons.

Slake the Lime and while it is slaking stir in the Paris Green. Strain the mixture through a coarse sieve and dilute with the required amount of water. The stronger mixture is used on potatoes and the weaker one for fruits. Paris Green is sometimes used as a dust spray, either alone or with one hundred times its weight of Plaster. London Purple is a substitute for Paris Green, but is less likely to be pure and is more likely to injure the foliage.

White Arsenic.—White Arsenic is much cheaper than Paris Green, is less likely to be adulterated, and is just as effective. It is prepared for spraying as follows: In 2 gallons of water, place 2 pounds of freshly-slaked lime and 1 pound of Arsenic. Boil from one-half to three-fourths of an hour. The boiling dissolves the Arsenic and enables the two ingredients to unite in an insoluble compound. One pound of Arsenic prepared above suffices for 300 gallons of water for fruit trees and 200 gallons for potatoes. It is very desirable that this mixture be used with Bordeaux as a fungicide as well as an insecticide.

Hellebore.—

White Hellebore..... 1 pound.
Water.....40 gallons.

White Hellebore is most often used as an internal poison, but it also kills by contact. It is best applied as a liquid in the above proportions, but can be used in a dust spray by mixing it with four times its weight of plaster. Hellebore is especially useful as a spray when parts of a plant are ready for use, as it quickly loses its poisonous qualities. It is the standard remedy for currant worms.

Kerosene Emulsion.—Place 2 gallons of ordinary Kerosene in a warm place and allow it to become as warm as possible without danger from fire. Boil 1 pound of laundry or whale oil soap in a gallon of soft water until completely dissolved. Remove the soap solution from the fire, and while still boiling hot add the Kerosene and agitate with a spray pump by forcing the liquid back into the vessel from which it was pumped until the oil is emulsified. When the liquid is perfectly emulsified it will appear creamy in color, and will flow evenly down the side of the vessel. Care should be

taken to completely emulsify the oil, and this is accomplished much more easily when the mixture is hot. This oil emulsion may now be diluted with water and used, or it may be stored away for future use. When cold it is like sour milk in appearance. It should be dissolved in three or four times its bulk of hot water before diluting with cold water. If the water is at all hard, add a little sal-soda before putting in the soap. In spraying, dilute with from 3 to 20 times as much water as Kerosene.

Lime, Salt and Sulphur.—This is a contact insecticide which should be used late in the winter, but before the buds swell in the spring. If used when foliage is on the tree, the foliage will be killed. It is made as follows:

Stone Lime	15 pounds.
Flowers of Sulphur	15 "
Common Salt	15 "
Hot Water	50 gallons.

The Lime is slaked with hot water and the Sulphur is added, after which the mixture is boiled, just enough water being used to dissolve both Lime and Sulphur. When both are dissolved, the liquid should be amber colored and clear. (It should take an hour or more of boiling.) Then add the salt and boil again for fifteen minutes, or until all is dissolved. Strain, dilute with hot water to make 50 gallons, and apply warm through a coarse nozzle. This is the standard remedy for San Jose scale.

Tobacco.—Tobacco, in the form of dust or stems, may be obtained from cigar manufacturers. It is useful in destroying root-aphis, especially woolly aphis on young trees. It should be worked into the ground liberally for root-aphis. Thrown on the ground about the roots it repels the striped cucumber beetle. It will prevent various beetles from depositing eggs, and usually keeps the roots of plants free from grubs for this reason.

A teaspoonful placed on the surface at the base of each cabbage plant when set out will protect it from the cabbage maggot.

A decoction or tea, made from stems, will kill plant lice on foliage if applied when the insects first appear.

Whale Oil Soap.—This remedy has the advantage of being ready made; it requires no preparation other than that of dissolving. It may be used in winter or summer. In winter it should be put on warm. It costs from 3½ to 5 cents per pound when purchased in quantity. For a spray against San Jose scale, or any other scale, the insects should be covered by the liquid in the early spring if possible, but before the buds begin to swell.

As a summer spray against plant lice, etc., it is prepared by dissolving 1 pound of the soap in from 4 to six gallons of water.

Insect Powder, Buhach, Pyrethrum.—This valuable remedy has one drawback, namely, high cost. It is too expensive for use on a large scale. It kills insects but is harmless to man and beast. It is the sovereign remedy for fleas; rub it into the hair or fur of the infested cat or dog, and blow it on the carpet if the house is infested. It will kill many of the insects of the garden if dusted on; or it may be made into a tea by boiling with water, and diluted to the proportion of 1 ounce to 2 gallons of water.

It is very effective against flies. Draw the flies into one room by darkening the rest of the house, and then in the evening blow the powder into the air. Sweep the flies into the fire the next morning before they recover from the stupefaction caused by the Pyrethrum.

Use this powder when it is undesirable to use poisons, but never buy it unless it can be had in tightly sealed packages. It loses its strength after a short exposure to the air.

FUNGICIDES.—It is necessary to recommend but three formulas for fungicides, the following being sufficient for all practical purposes:

Bordeaux Mixture.—

Copper Sulphate	4 pounds.
Quick Lime	4 "
Water	40 gallons.

Dissolve the Copper Sulphate in a barrel by suspending it in a basket. Use 10 gallons of water. Slowly slake the Lime, which must be of good quality and not at all air-slaked. Add

10 gallons of water to the slaked Lime. Then mix the two in a third receptacle, pail by pail, taking care that the water is cold, and add the remainder of 40 gallons of water. The above directions should be carefully followed to obtain the best results.

For the large orchards stock solutions are made by dissolving 40 pounds of the Sulphate in as many gallons of water. Slake 40 pounds or more of Lime in a box. As needed for spraying take as many gallons of the Copper Sulphate solution as are required, remembering that there is one pound of the chemical in each gallon of water. Dilute this solution with the required amount of water in the tank or barrel of the spraying outfit, and then add the prepared Lime, estimating as closely as possible the correct weight. To make sure that sufficient Lime has been added, test as follows:

Insert a clean, well-scoured knife blade in the solution. Copper will be deposited on the blade if there is not sufficient Lime. Or, blow the breath on a saucer full of the mixture; a film of Carbonate of Lime will form on the surface of the liquid if sufficient Lime has been added.

Copper Sulphate Solution.—

Copper Sulphate..... 1 pound.
Water..... 25 to 50 gallons.

This is a cheap, simple, effective winter and early spring spray. Its effect on fungi is the same as is that of Bordeaux mixture, though it is not as lasting. It has the great merit of being easy to prepare and to apply. It is obvious that it should never be applied to any plant when the leaves are out. This solution is especially useful as a preventive of leaf-curl of the peach.

Used at the rate of 1 pound to 300 gallons of water, this solution is most excellent when fruits are nearing their ripening period in place of Bordeaux mixture, which would discolor them.

Potassium Sulphate.—

Potassium Sulphate..... 3 ounces.
Water.....10 gallons.

This formula is much used for gooseberry mildew, for which it is more effective than Bordeaux mixture. It is not poisonous and does not discolor the fruit.

SPRAYING CALENDAR

Explanation.—Italics are used to indicate applications of greatest importance. The white arsenic formula may be substituted for Paris green, if desired. The list of insects and fungi includes only those most troublesome to the plants specified in this Calendar.

PLANT	First Application	Second Application	Third Application	Fourth Application	Fifth Application
APPLE . . . . (*Scab, codling moth, bud moth, canker worm, tent caterpillar, aphis.*)	Spray before buds start with copper sulphate. *For aphis and scale insects use kerosene emulsion.*	*After the blossoms have formed, but before they open, spray with Bordeaux and Paris green.*	*Within a week after the blossoms fall, Bordeaux and Paris green.*	10–14 days later, Bordeaux and Paris green.	*Spray fall and winter varieties with Bordeaux and Paris green about the first of August.*
CABBAGE . . . (*Worms, aphis and flea beetle.*)	*When worms are first seen, Paris green. For flea beetles use tobacco dust.*	*If worms reappear, repeat if plants are not heading.*	*After heads form, use hot water or pyrethrum.*	Repeat if worms reappear. For aphis use kerosene emulsion.	
CHERRY . . . (*Rot, aphis, curculio, slug and leaf blight.*)	*Before the buds open, spray with copper sulphate; for the aphis use kerosene emulsion.*	*When the fruit has set, spray with Bordeaux and Paris green.*	10–14 days later, if slugs or signs of rot appear, repeat.	10–14 days later, weak copper sulphate solution if necessary.	
CURRANT . . . (*Mildew, worms, borers and leaf blight.*)	*When worms are found on lower and inner leaves, spray with Paris green.*	*If worms reappear, repeat, adding Bordeaux for mildew and leaf spot.*	If worms still trouble, hellebore.	After fruit is picked, Bordeaux for leaf spot.	
GOOSEBERRY . (*Mildew, leaf blight and worms.*)	*As leaves open, Bordeaux and Paris green.*	*In ten to fourteen days repeat with both.*	*10–14 days later use sulphide of potassium on English varieties.*	*10–14 days later repeat.*	
GRAPE . . . . (*Rot, mildew, anthracnose, flea-beetle and leaf hopper.*)	Before buds burst, spray with copper sulphate solution.	*When first leaves are half grown, Bordeaux and Paris green. For leaf hoppers use kerosene emulsion.*	*When fruit has set use Bordeaux and Paris green.*	Repeat, if necessary, at intervals of 10 to 14 days.	

PEACH, APRICOT (*Leaf curl, curculio, mildew and rot.*)	*Before April 1, spray with copper sulphate solution.*	*When fruit has set, use Bordeaux mixture and Paris green, two-thirds strength.*	10–14 days later repeat.	If rot appears, use weak copper sulphate solution.	Repeat if necessary.
PEAR . . . . (*Leaf blight, scab, slug and codling moth.*)	Before buds open, copper sulphate solution.	*When the blossoms have formed, but before they open, Bordeaux and Paris green.*	*Within a week after the blossoms fall, Bordeaux and Paris green.*	Repeat in ten or twelve days, if necessary.	
PLUM . . . . (*Curculio, rot, shot-hole fungus, black knot.*)	*Cut and burn black knots whenever found. Before buds open, spray with copper sulphate*	*As soon as the blossoms have fallen, use Bordeaux and Paris green.*	*10–14 days later, repeat.*	Repeat if necessary at intervals of 15–20 days.	After fruit begins to color, use weak copper sulphate should rot appear.
POTATO . . . (*Blight, beetles and scab.*)	*Soak seed for scab in corrosive sublimate (two ounces to sixteen gallons of water), for ninety minutes.*	*When beetles or their larvae appear, Paris green.*	*Repeat whenever necessary.*	For leaf blight use Bordeaux.	Repeat in ten days if necessary.
QUINCE . . . (*Leaf and fruit spots, slug.*)	*Before the buds open spray with copper sulphate.*	*When the fruit has set, Bordeaux and Paris green.*	10–12 days later, repeat.	10–20 days later, Bordeaux.	
RASPBERRY BLACKBERRY (*Anthracnose, rust, cricket, slug and galls*)	Before buds open, spray with copper sulphate.	*When new canes are one foot high, Bordeaux and Paris green.*	10–14 days later, repeat.	Spray with Bordeaux if necessary.	If red rust appears the entire plant affected should be grubbed out and burned.
STRAWBERRY (*Rust and leaf-eating insects.*)	*Just before the blossoms open, Bordeaux and Paris green.*	After the fruit has set, use weak copper sulphate solution.	As soon as berries are harvested, Bordeaux (if to be kept longer.)		
TOMATO . . . (*Rot and blight.*)	*If either disease appears, Bordeaux.*	*Repeat if disease continues.*	Repeat if necessary.		

HINTS ON SPRAYING.—

First.—It is never necessary to spray when plants are in bloom, and it should never be done, as bees and other beneficial insects are thus poisoned. Fruit blossoms are not well cross-pollinated without large numbers of bees or other like insects.

Second.—A tree is well sprayed only when it is wet all over from tip to roots. On the other hand all drip is clear waste.

Third.—The time to spray and the number of applications depends upon each particular case. The conditions that affect spraying most are rainfall, prevalence of pests, varieties and value of crops.

Fourth.—The fruit grower must know exactly what he wants to kill and how to kill it. Therefore, the more he knows of the life habits of pests the better he is able to combat them.

Fifth.—Apples, pears, plums, peaches and grapes should be sprayed every year. Other fruits should be sprayed only when signs of pests or of their coming are apparent. Spraying is to an orchard what insurance is to a householder; it is more, since spraying always does some good.

Sixth.—There is no danger in eating fruits properly sprayed with Paris Green or other Arsenites. The quantity of the poison applied is too minute, and it is mostly washed out before fruits are edible. Animals are never poisoned by eating the pasturage under properly sprayed trees.

Seventh.—Fruit trees are often injured by Bordeaux mixture in wet weather. The rainwater sets free an acid which burns fruit and foliage. An excess of lime in the mixture prevents such burning.

THE SPRAYING OUTFIT.—A good spraying outfit consists of a round bottom tank holding three hundred gallons, best mounted on a handy wagon, to hold the spraying solution. A barrel can take the place of a tank for a small orchard. Mounted on the tank or barrel should be a pump of good pattern, having sufficient power to supply two runs of hose. The hose must be of best quality and preferably should be ⅝ of an inch in

diameter. Each run of hose should supply a double nozzle of approved style. A ten foot extension rod is necessary to get the nozzle up into the branches, and for very high trees a steeple platform on the tank is a valuable adjunct.

The essentials of a good spray pump are: That it be durable; that it work with ease; that the parts be easily gotten at for cleaning or repairing; that it be compact and that it have an efficient agitator. To secure the first end the pump must be made of brass. Iron is rusted or eaten by almost all spraying mixtures. To secure ease the pump should be one of the vertical rather than of the horizontal type. Agitators that paddle up and down with the movement of the pump handle are better than those that rotate. In the garden the bucket pump is better than the knapsack sprayer.

The nozzle is an all important part of the spraying outfit. The style of the nozzle depends largely upon the work that is to be done. It is essential that the spray reach the tree in the shape of a very fine mist or fog. A good nozzle must carry a stream for some distance and then cause it to break up into a mist. Of the hundreds of nozzles, the Cyclone is admitted to be the best for short range, as for use on small fruits and vegetables. While the Vermorel, or some of its modifications, is the best for long range. Double, triple and quadruple nozzles now take the place of the old single ones.

No matter what the nozzle, it must be lifted up into the branches. For this purpose a bamboo extension rod lined with a ⅜ inch brass tube is the best. At the lower end of the rod is a stop-cock and a hose connection; at the upper end is the nozzle or cluster of nozzles. Extension rods vary from eight to twenty feet in length. Long rods come in sections.

In conclusion it may be said that man's power over the tiny organisms which destroy the plants we cultivate never has been as great as it is at the present time. Spraying has put this power in our hands. Spraying as a practice is founded on careful investigations by scientists, and upon the accumulated experience of all our best plant growers, and it is now as firmly established as is any other farm or orchard operation.

DICTIONARY OF TECHNICAL AND OTHER TERMS IN COMMON USE

It has been the aim of all concerned in the publication of this book to make all statements as free as possible from technical and uncommon words, but occasionally one's mind needs to be refreshed as to the meaning of a word in the book, or the owner of a copy may hear a term used in connection with animal diseases, which he does not understand. To help the subscriber in such a case, this dictionary is added.

Abdomen—The belly; that part of the body containing the stomach and intestines.

Ablactation—A weaning or cessation from suckling.

Abomasum—The last or fourth stomach of animals that chew the cud.

Abortion—Expulsion of the fœtus before it is capable of sustaining life.

Abrade—To rub off, as a piece of skin.

Abscess—A swelling and its cavity containing pus or matter.

Abscission—The cutting away or removal of a part.

Absorb—To swallow up; to drink in; to cause to be removed.

Absorbent—In anatomy, one of those vessels which imbibes or takes up, as the lacteals or lymphatics. In medicine, any substance, as chalk, or magnesia, used to absorb acidity of the stomach; or any substance applied to a wound to take up the discharge.

Accelerate — Growing quicker and faster, as an accelerated pulse.

Acetabulum — The bony cup which receives the head of the thigh bone.

Acid—Sour. The last fermentation before the putrid.

Acme—The top, or highest point.

Acrid—Pungent, irritating.

Acute—Sharp, severe: an acute disease is severe, and speedily comes to a crisis.

Adamantine Substance—The enamel of the teeth.

Adenitis—Inflammation of the glands.

Adhesion—A joining together, as the union of parts in healing.

Adipose—Fatty matter; belonging to fat.

Adventitious — Accidental; acquired, as diseases.

Aerate—Mixing with air, as the blood in the lungs, by which it absorbs oxygen.

Aetiology—Relating to the cause of disease.

Affection—Disease, or disease of some particular part.

Affinity—The attraction which causes bodies to adhere and form compounds. That which causes to cohere.

Affluence—Determination of blood, or of humors, to a part.

Albumen — Substances, animal and vegetable, resembling the white of an egg.

Albumenuria—That condition in which the urine contains albumen, and an excess of urea, coagulable by nitric acid and heat.

Aliment—Any kind of food.

Alimentary Canal—The canal extending from the mouth to the anus, through which the food passes.

Alkali—Any substance that will neutralize an acid, as magnesia, soda, potash, etc.

Alterative—A medicine that gradually induces a change.

Alveolar Processes—That part of the jaw that contains the sockets of the teeth.

Amaurosis—A loss of sight from loss of power of the optic nerve.

Amnion—A membrane enveloping the fœtus and the liquid.

Amyloids—Foods composed of carbon and hydrogen, as sugar and starch.

Anæmia—A morbid condition of the blood, in which it is deficient in quantity or in quality.

Anasarca—Dropsy of the limbs, abdomen, chest, etc.

Anæsthetic—That which produces insensibility to pain.

Analysis—Separation into parts; resolving into original elements.

Anatomy—The science of the structure of the body.

Anchylosis—The stiffening, or uniting rigidly the parts of a joint.

Animalcule—An animal that is invisible, or nearly so, to the naked eye.

Anodyne—A medicine that allays. or diminishes, pain.

Antacid—A remedy for acidity, as an alkali.

Anterior—Before; in front of another part

Anthelmintic—A remedy to destroy, or expel, worms; a vermifuge.

Antidote—A remedy to counteract the effects of a poison; that which counteracts hurtful, or noxious, substances.

Antiperiodic—Medicine to arrest, or retard, the return of a paroxysm in a periodic disease.

Antiseptic—An agent for preventing, arresting, or retarding putrefaction.

Antispasmodic—A remedy which relieves spasms.

Anus—The posterior opening of the alimentary tract.

Aorta—The first great artery to leave the heart.

Aperient—Laxative medicine; that which gently operates on the bowels.

Aphtha—Ulceration of the mouth, beginning with minute blisters, and ending in a white slough.

Apoplexy—Sudden effusion of blood into the substance of the brain.

Aqueous—Watery; having the property of water, as watery matter, aqueous pus.

Arachnoid—A thin membrane covering the brain.

Areolar Tissue—A network of delicate fibres spread over the body.

Artery—One of the blood vessels which carries the red blood from the heart.

Articulate—Joining, working together, or upon one another, as the bones.

Asphyxia—Apparent death, or suspended animation. Death from want of air.

Assimilate—To make like another; assimilation of food in the nutrition of the body.

Asthma—A disease attended with difficulty of breathing, and a sensation producing wheezing, coughing, and other distressing symptoms.

Astragalus—The largest bone composing the hock joint, lying in front of another called os calcis.

Astringent—That which binds or contracts. Astringent medicines contract the tissues and suppress discharges, as from the bowels, blood, or mucus.

Atlas—The first bone of the neck, or first cervical vertebra.

Attenuate—To draw out, to make thin, to reduce in size, or strength.

Atrophy—A wasting away from lack of nourishment.

Auricle—The external part of the ear; also parts of the heart, one on each side resembling ears.

Auscultation—A method of distinguishing diseases, especially those of the chest, by listening to the sounds made by the lungs and heart.

Bars—(Of the hoof).—The two ridges of horn, passing from the heels of the hoof toward the toe of the frog. (Of the mouth). The transverse ridges on the roof of the mouth of the horse.

Bicipital—Two-headed, as biceps muscles, bicipital groove, etc.

Bile—A bitter, yellow, or greenish fluid, secreted by the liver.

Biliary—Pertaining to bile. Biliary duct, a canal containing bile.

Biology—The science of life, or of living bodies.

Biped—Two-footed, as man.

Bisect—To divide into two equal parts.

Bistoury—A small cutting knife.

Blood Serum—The yellow serum that is left after the coagulation of the blood.

Bolus—A large pill. Medicine formed in a round, or cylindric, shape, and often called a ball. The cylinder shape is best.

Boot—A buffer, a leather band, worn to prevent one foot cutting the other when traveling.

Bougie—An instrument for opening the urethra, or urinary, or other passages.

Breeding-in-and-in—Breeding to close relations, in the same sub-family, as the produce of the same sire but different dams, or of the same sire and dam.

Bronchi—First two branches of the windpipe. Bronchitis is the inflammation of the bronchia.

Broxy—Term applied to a number of fatal diseases of sheep, especially to a form of anthrax or carbuncular fever.

Cadaverous—Having the appearance of a dead body. (From the Latin *cadaver*, a corpse.)

Cæsarian Operation—The cutting into the abdomen and womb to bring away the fœtus, when natural delivery cannot be accomplished.

Calcareous—Containing lime, lime-like.

Calculus—Stones formed by the deposit of solid matter in any part of the body.

Calks or Calkins—The heel of the horseshoe when turned down to prevent slipping; also wounds made by the calks.

Callous—Induration; a hard deposit; an excess of bony matter

Canal—A tube or passage, as the alimentary canal.

Canine Teeth—The teeth between the lateral incisors and the small molars of the jaw.

Canker—Any sore that eats or corrodes, as eroding ulcers of the mouth.

Cannon-bone—The bone below the knee and the hock.

Canula—A hollow tube of metal or other substance, used especially with the trocar when tapping cavities, to draw off water or gas.

Cantharis (plural, Cantharides)—A winged insect or beetle, used for blistering; Spanish flies.

Capillary—Hair-like; a term applied to the minute branchings of the blood vessels. The capillary vessels connect the veins and the arteries.

Capsular Ligaments—The ligaments surrounding the joints.

Capsule—A membranous bag or sac.

Carbon—An elementary substance forming the base of charcoal, which is impure carbon. The diamond is pure carbon. Carbonic Acid gas is expelled from the lungs in breathing.

Carminatives—Warming, stimulating and aromatic medicines which tend to expel wind, or to remedy colic or flatulencies.

Carotid Arteries—The great arteries of the side of the neck.

Cartilage—Gristle.—The substance covering the ends of the bones moving and working upon each other.

Caseine—The curd or coagulable part of milk; the basis of cheese.

Castrate—To geld, emasculate; to deprive of testicles.

Catarrh—An inflammation or congestion of any mucous membrane; a cold attended with running of the nose.

Cataract—An opacity of the crystaline lens of the eye, causing partial or total blindness.

Cathartic—A purgative medicine, used for freely opening the bowels.

Catheter—An instrument used for drawing the water from the bladder.

Caustic—A substance which burns or destroys tissue, as Caustic Potash, and Nitrate of Silver.

Cauterization—Searing with a hot iron, or with Caustic medicines.

Cellular Tissue—The membrane, or tissue, which invests every fibre of the body, composed of minute cells communicating with each other, and which serves as reservoirs for fat.

Cephalic—Pertaining to the head.

Cerebral—Pertaining to the brain. Cerebellum, the smaller and lower brain. Cerebrum, the upper and larger brain.

Cervical—Belonging to the neck.

Characteristic—That which is peculiar to a thing, or distinguishes it from another.

Cholagogue--A medicine that increases the secretion of bile.

Chronditis—Inflammation of the cartilages.

Choroiditis—Inflammation of the choroid coat of the eye.

Chronic—A lingering, long-standing disease, succeeding the acute stage.

Chyle—The milky liquid food, as it is found in the intestines during digestion, and prepared from the chyme, and ready to be absorbed by the lacteal vessels before being poured forth into the blood.

Chyme—The food as modified and prepared by the action of the stomach.

Cicatrix—A scar left after the healing of a wound, or ulcer.

Cilia—Small hairs.

Circulation—The vital action which sends the blood through the arteries and back again through the veins to the heart.

Clyster—Liquid medicine injected into the lower intestine.

Coagulate—To change to a curd-like state; to thicken, or harden.

Coffin-bone—The lower bone of the leg encased in the hoof.

Collapse—A falling together. A closing of vessels. Extreme depression of vital powers.

Colon—The largest division of the intestinal canal.

Coma—Lethargy. Drowsiness produced by depression of the brain.

Conception—The beginning of pregnancy; fecundation by the act of the male.

Concretion—A mass formed by the union of separate particles into one body.

Condiment—Substances used to improve, or heighten, the flavor of food.

Congenital—Born with another; of the same birth. Belonging to the individual from birth.

Confluent—Flowing together; running one into another.

Congestion--An accumulation of blood in any part of the body, as the lungs, brain, etc.

Conjunctiva--The membrane that lines the eyelids and covers the outer surface of the eyeball.

Constriction—Drawing, or binding, together, as constriction of the muscles of any part.

Constipation—An unnatural detention of the fecal matter of the bowels; costiveness.

Contagion—The transmission of a disease by direct, or by indirect, contact.

Contorted—Twisted, twisting, writhing, as the body in pain, or from the result of disease.

Contusion—A bruise; a wound made by a blow, or a bruise.

Convoluted—Rolled together, or upon itself. The cerebrum is convoluted.

Cornea—A transparent covering of the front of the eye.

Coronet—The upper part of the hoof, just where it joins the skin.

Corrosive—That which eats away, destroying the texture of the living body.

Costal—Belonging to the ribs. From *Costa*, a rib.

Counter Irritation.—An application to irritate one part of the body to relieve pain in another. A blister, or mustard poultice, produces counter-irritation.

Cranium—The skull. Cranial; pertaining to the skull.

Crepitation—Term applied to the noise made by the ends of fractured bones, when they grate together. Also the sound produced by pressing together cellular tissue in which air is contained.

Cribbing (of Horses)—The act of seizing any hard substance, or pressing thereon with the teeth, and gulping; sometimes called wind-sucking, though the latter is not necessarily cribbing.

Croup or Crupper—The top of the hips of a horse; also the strap of leather going under the tail.

Cul-de-sac—A passage closed at one end.

Curb—A soft swelling becoming hard, situated on the back part of the hind leg, just below the point of the hock.

Cutaneous—Pertaining to the skin. Cuticle, the epidermis or scurf skin.

Cyst, Cystis—A small bladder or sac; applied to those containing morbid matter or parasites, which become encysted or enclosed in an envelope.

Cystitis—Inflammation of the bladder.

Decoction—An extract prepared by boiling something in water.

Defecation—Purifying from impurities of foreign matter. The voiding of excrement from the body.

Deglutition—The act of swallowing. Power of swallowing.

Dejection—In medicine; the act of voiding excrement; the excrement voided.

Degenerate—To grow worse or inferior.

Deleterious—That which is destructive or poisonous.

Delirious—Insanity; a wandering of mind in disease.

Deliquescent—The act of becoming liquid by attracting moisture from the air.

Demulcent—A liquid or substance that is of a mucilaginous nature, and is thought to protect the tissues from the action of acrid or irritant substances.

Dens—A tooth. Dental, pertaining to teeth. Dentition, the development of teeth.

Deodorizer—A substance that destroys bad odors.

Depletion—The act of emptying. A condition of exhaustion.

Dermal—Pertaining to the skin.

Dessicate—To dry up.

Desquamation—A scaling off of the skin.

Diabetes—An excessive flow of urine. A flow of urine containing saccharine matter.

Diagnosis—The distinguishing of one disease from another.

Diaphoretic—A medicine that causes perspiration, or sweating.

Diaphragm—The midriff. The membrane, or broad muscle that separates the thorax, or chest, from the abdomen, or belly.

Diathesis—Peculiarity of constitution.

Diffuse—To extend, or drive out. That which may flow or spread, as a diffusible stimulant.

Dilate—To open wide, as the eye.

Dilitation—The expansion of a body from over-fullness.

Dilute—To make thin, as medicine with water, with oil, etc.

Diminution—A lessening, or decreasing, as of pain, etc.

Disinfection—The act of freeing from infectious matter.

Dislocation—Putting out of joint.

Dissection—Exposing the different parts of a dead body, in order to study structure and arrangement.

Distorted—Deformed, crooked, out of the natural shape.

Distend—To stretch out, or swell.

Diuretic—A medicine that increases the flow of urine.

Dorsal—Pertaining to the back. The dorsal column; the back bone.

Douche—Dashes or jets of water or vapor directed to some diseased part.

Dram or Drachm—The eighth part of an ounce.

Drench—Liquid medicines given by the mouth.

Duct—A tube or vessel for conveying a fluid or the secretions of the glands.

Duodenum—The first portion of the small intestines, into which the bile is poured.

Dura Mater—Thick fibrous membrane lining the cavity of the skull.

Dysuria—Painful and incomplete passage of urine.

Ecbolics—Agents that cause contraction of the womb.

Ectozoön—Parasites, as lice, infesting surface of the body.

Ecraseur—An instrument used in surgery, especially in castration.

Effluvia—Morbid exhalations of the body; sometimes applied to animal and vegetable odors.

Effusion—The pouring out of blood or other fluids from the proper vessels into the cellular tissue or into a cavity.

Ejection—Casting out, as ejecting improper matters from the stomach.

Eliminate—To discharge or expel.

Emasculation—Removal of the male generative organs; castration.

Embryo—The impregnated ovum in the womb, after its growth has begun.

Emetic—A medicine given to induce vomiting.

Emollient—Softening or relaxing.

Encysted—Enclosed in a sac.

Endocardium—The lining membrane of the heart.

Enema—Medicines given by injection into the rectum.

Enteric—Belonging to the bowels. Enteritis is inflammation of the bowels.

Entozoa—Parasites within the body.

Epidemic—A disease that affects a large number, as though carried through the air, and in which the death rate is high.

Epiglottis—The covering of the glottis. A tongue-shaped projection to prevent food or liquids from entering the windpipe.

Epithelium—The thin covering upon the lips, nipples, mucous, and serous membranes; the lining of the blood vessels and other canals.

Epizoötic—A contagious disease, attacking a large number of animals at once. Applied to catarrhal fever or influenza, which spreads rapidly.

Equine—Belonging to the horse.

Esophagus—Oesophagus—The gullet, or tube of the throat which conveys food to the stomach.

Evacuate—To empty, or pass out, as to evacuate the bowels.

Excision—The cutting out, or cutting off, any part.

Excoriate—To remove the skin in part; to rub and gall, or break the skin; to abrade.

Excrement—Refuse matter; the dung.

Excrescence—An unnatural or superfluous growth.

Excretion—The act of throwing off effete matter from the animal system. That which is thus thrown off.

Exhalation—A breathing out, as the air from the lungs.

Exostosis—An unnatural growth, or projection of bone.

Expectorant—A medicine that promotes discharge from the lungs or throat.

Extensor-tendons—The tendons which stretch out the limbs.

Extirpation—The complete removal of a part with a knife.

Extravasate—To let out of the proper vessel, as the blood, after the rupture of a blood vessel.

Exudate—A sweating, or passing out of a liquid through the walls or membranes containing it. The liquid after it is passed out.

Facial—Pertaining to the face.

Feces—The excrement from the intestines.

Febrifuge—A medicine that lowers the temperature of the body, and counteracts fever.

Febrile—Pertaining to fever.

Feculent—Foul or impure matter, formed by the breaking down of the tissues; excrementitious matter.

Femur—The thigh-bone proper.

Fermentation—A change brought about by a process of decomposition.

Fetid—Having an offensive odor.

Fibrin—An organic substance found in the blood, which causes it to clot.

Fibrous Tissue—Connective tissue, composed chiefly of white inelastic, or yellow elastic fibers.

Fibula—The small, or splinter bone of the leg, attached to the outer side of the tibia.

Fistula—A deep, narrow ulcer, having a passage leading to it, with a constant discharge.

Flanks—That part of the horse between the false ribs, hips, and stifle.

Flatulent—Generating, or tending to generate, wind in the stomach and intestines.

Flexor—A muscle whose office is to bend a part. In apposition to extensor.

Fœtus—The young unborn.

Fomentations—Local applications of cloths wrung out in hot or cold water.

Foramen—A hole passing through; applied to holes in bone; also other tissues.

Fumigate—To apply smoke or vapor.

Function—The office or duty of any part of the body.

Fundament—The anus or extremity of the bowel. The end of the gut.

Fundus—The bottom or base of any organ.

Fungus—A spongy growth resembling mushrooms.

Gall—The fluid contained in the gall-bladder, consisting principally of the bile secreted by the liver.

Ganglion—A bunch of nerve fibers, causing the enlargement of a nerve, and resembling a knot. A nerve center.

Gangrene—Death of a part of the body, or of any portion of its tissues.

Gastric—Pertaining to the stomach. Gastritis, inflammation of the stomach.

Gelatine—Animal jelly. Gelatinous: jelly-like.

Generate—To beget offspring; begetting or producing young; breeding.

Genitals—The organs of reproduction or generation.

Gland—A structure for secreting certain fluids of the body, and containing a tube.

Glans—The head of the penis.

Gestation—The condition of pregnacy, or being with young.

Gleet—Thin matter issuing from an ulcer. In horses, applied to nasal gleet almost exclusively.

Glottis—The narrow opening at the top of the windpipe.

Graminivorous—Feeding on grasses and other vegetable food.

Graniverous—Feeding on grain and other seeds.

Granulate—To grow or develop in the form of grain, as new flesh in the healing of a wound.

Gravel—Calculous matter found in the kidneys or bladder.

Gravid--The state of being with young.

Groin—The oblique depression between the abdomen and thigh.

Haunch—That part of the body that lies between the last ribs and the thigh. In the horse, the bony region of the hips.

Haw—The process of the eye socket, which is thrown over the eye to clear it of foreign substances.

Haematin—The coloring matter of the blood.

Hemiplegia—Paralysis, affecting one side of the body.

Hemorrhage—A discharge of blood from the vessel containing it; bleeding.

Hepatic—Belonging to the liver. Hepatitis: inflammation of the liver.

Herbivorous—Feeding on herbs.

Hereditary—Transmitted from parent to offspring.

Hernia—Rupture, or soft tumor, formed by the protrusion of any internal part through a natural or accidental opening in the enclosing membrane.

Humor—Any fluid of the body, excepting the blood.

Humerus—The upper bone of the fore leg.

Hybrid—The offspring of two different species of animals, as of the horse and the ass—the mule.

Hydrocephalus—Water in (dropsy of) the head.

Hygiene—The preservation of health and prevention of disease.

Hymen—The fold of mucous membrane between the vulva and the vagina.

Hyperæmia—A superabundance, or congestion of blood in any part of the body.

Hypertrophy—Excessive growth; enlargement; thickening.

Hypodermic—Beneath the skin. Used principally of medicines—as morphia, etc., applied by injection under the skin.

Ileum—The lower part of the small intestine.

Ilium—The flank bone, which in the fœtus, is distinct from the other hip bones.

Impregnation—The act of rendering, or state of being, pregnant.

Incision—The act of cutting, as in an operation.

Incisors—The front teeth of the jaws.

Incontinence—Inability to retain the natural evacuations.

Induration—The hardening of a part from the effects of disease.

Infection—Communicating disease by germs.

Infusion—Liquid produced by steeping insoluble substances in water without boiling.

Inhalation—A drawing into the lungs; the inbreathing of medicated or poisonous fumes.

Injection—Liquid medicines thrown into a natural or artificial cavity. Usually with a syringe.

Inoculation—The production of disease by virus or matter from a sore, communicated from one animal to another.

Instinct—Sense, as applied to animals.

Integument—The covering which invests the body (the skin), or a membrane covering any particular part of it.

Intercostal—Between the ribs.

Intermittent—Coming and going at intervals.

Interstice—A small space between the particles of a body.

Intussusception—The slipping of the upper part of the small intestines into the lower.

Iris—The circular membrane of the eye, which gives the eye its color, and perforated to form the pupil.

Jejunum—The middle division of the small intestine, or that portion between the duodenum and the ileum.

Jugular Vein—The large vein of the neck.

Labial—Belonging to, or pertaining to, lips.

Lacerate—To tear. A lacerated wound is a torn wound.

Lachrymal—Pertaining to tears. The lachrymal duct is the one leading from the nose to the eyes.

Lactation—The act of giving suck, or time of suckling.

Lacteals—The lymphatic vessels of the intestines.

Lactic Acid—The acid of sour milk.

Lamella—A thin plate or scale; pertaining to the anatomy of the foot.

Laminitis—Founder; an inflammation of the sensitive parts between the pedal or coffin-bone and the hoof.

Larynx—The enlarged upper portion of the windpipe, and extending into the throat. Laryngitis: inflammation of the larynx.

Lateral—At, or to, one side.

Lesion—Any hurt or injury.

Levator—A general name for a muscle whose office is to raise some part, as the lip or eyelid.

Ligaments—The bands which bind the bones together at the joints.

Ligature—Silk or flax thread, or any material suitable for tying arteries. Also a bandage used to stop bleeding.

Liquefaction—The act or process of reducing a solid to a liquid form.

Lithotomy—The operation of extracting a stone from the bladder.

Lobe—A round, projecting part of any organ, as of the lungs and liver.

Loin—That portion of the body between the hip-bone and ribs.

Lotion—Fluid applied externally, usually by means of a cloth kept constantly wet therewith. Liniments are applied externally, but with rubbing.

Lumbago—Rheumatism of the lumbar region of the back.

Lymph—A transparent and nearly colorless fluid, found in the lymphatic vessels.

Macerate—To soften and separate the parts of, by steeping, as in a fluid, or by the digestive process.

Malady—Disease, or ailment.

Malar—Pertaining to the cheek-bone.

Malformation—Badly, or unnaturally, shaped, or formed.

Malignant—Severe. Tending to produce death.

Mallenders—An eczematous condition occurring in the flexures of the knee-joints, causing dryness and scurfiness of the part.

Mammals—Having an udder, or teats, for suckling the young.

Mammary Glands—The glands which secrete the milk.

Manipulation—The act of treating, working, or operating with the hand.

Massage—Kneading and rubbing the flesh with the hands.

Mastication—The act of chewing the food.

Materia Medica—A term including all medicines, or substances, used in the cure of disease.

Maxilla—The upper, or lower, jaw.

Meatus—Canal, or passage.

Mediastinum—The partition formed by the meeting of the pleura, dividing the chest into two lateral parts, and separating the lungs.

Medullary—Consisting of, resembling, or pertaining to, marrow.

Membrane—A thin, sheet-like structure, usually fibrous, covering, or lining, some part, or organ.

Mesentery—The fold, or membrane, which attaches the intestines to the spine.

Metastasis—The transference of disease from one part to another.

Miasma—The product of animal or vegetable putrefaction, causing disease.

Midriff—The diaphragm.

Milk Fever—A disease affecting cows soon after parturition.

Molecule—The smallest portion of matter which can exist alone.

Morbid—A state of disease; the product or result of an unnatural state, as morbid humors.

Mortification—The death of a part from gangrene.

Motor—That which causes, or is the instrument of, movement; as the motor muscles.

Mucus—A mucilaginous fluid found on the surface of certain membranes, which keeps them soft and pliable.

Nævus—A natural mark or blemish; a birth-mark.

Narcotics—Drugs which allay pain and produce sleep, but first produce excitement.

Nasal—Pertaining to the nose.

Nausea—Any sickness of the stomach with inclination to vomit.

Necrosis—Death of a bone, or a portion of a bone.

Neuralgia—A painful affection that is seated in the nerves, especially of the face.

Neurotomy—The cutting or division of a nerve.

Neutralize—To destroy the force or effect of anything.

Nutritive—Tending to nourish or build up. Nutrition: that which nourishes.

Ocular—Relating to the eyes.

Oedema—Effusion of serous fluid into the cellular tissues, producing swelling.

Omentum—The Caul—A fold of the peritoneum membrane covering the intestines in front and attached to the stomach.

Opacity—Want of transparency; that quality of bodies, by which they cannot transmit the rays of light.

Optic—Pertaining to sight, as the optic nerve; relating to the laws of vision.

Orbit—In ocular anatomy, the bony cavity in which the eye is situated.

Organic—Composed of, or pertaining to an organ, or its function; dependent on, or resulting from, organism.

Orifice—The mouth or entrance to any cavity of the body.

Os—The technical name for a bone. Osseous: resembling bone; bony. Ossification: changing to bone.

Ostalgia—Pain in one or some of the bones.

Os uteri—The mouth of the womb.

Ovariotomy—The operation of removing the ovaries from the female animal; spaying—analogous to the gelding of the male.

Ovaries—The organs connected with the uterus that mature and give off the ova (eggs), which, when impregnated by the male, produces the fœtus.

Oxygen—The life-supporting element of the air, and constituting a little more than one-fifth of it. With nitrogen and argon it forms air; with hydrogen it forms water.

Ozœna—Nasal gleet; catarrh.

Palate—The roof of the mouth.

Palpitation—A rapid, thumping, movement of the heart, from mental excitement, or from disease.

Papillæ—Small, nipple-shaped prominences found on the tongue and skin.

Pancreas—The narrow, flat gland extending along the duodenum, sometimes called the "sweet-bread."

Paralysis—An affection impairing, or destroying, the natural function, especially the voluntary movement, of a part; called also "palsy."

Paraplegia—Paralysis of the hind quarters on both sides; usually due to some injury or inflammation of the spinal cord.

Parasite—An animal which lives on, or in, the body of another animal.

Parotid Gland—The largest of the salivary glands, situated below the ear.

Paroxysm—In disease, a recurrence coming after an intermission.

Parturition—The act of bringing forth the young.

Patella—The knee-pan.

Pathology—The science which treats of the causes, nature, symptoms, and cure of disease.

Pectoral—Pertaining to the breast, as the pectoral muscles. A remedy for affections of throat and lungs.

Pelvis—That part of the trunk bounding the abdomen at the rear, containing a part of the intestines, and the internal urinary and genital organs.

Penis—The exterior male organ of urination and generation.

Pericarditis—Inflammation of the pericardium, or serous membrane, enclosing the heart.

Perinœum—The space between the anus and the genital organs.

Periosteum—The fibrous membrane covering a bone.

Peritoneum—The serous membrane which lines the cavity of the abdomen.

Peritonitis—Inflammation of the peritoneum.

Pharynx—The muscular tube at the back part of the mouth which leads to the gullet.

Physiology—The science which treats of the functions of the various organs of the body.

Placenta—The membrane covering the young in the womb—the afterbirth.

Plethora—Having a full habit of the body; full of blood.

Pleura—The serous membrane which lines the interior of the chest and covers the lungs.

Plexus—Any union of vessels, nerves or fibers in the form of net-work.

Polypus—A tumor with narrow base which grows from mucous membranes.

Portal Vessels—The cluster of veins that join and enter the liver.

Post-mortem—Literally, after death. The examination of a dead body.

Predisposed—Prepared for, or fitted for, beforehand; inclined to; as being predisposed to disease.

Process—A prominence or projecting part; any protuberance, eminence or projecting bone.

Procreation—Generation and production of offspring.

Prognosis—The act or art of judging by the symptoms, the probable course of a disease.

Prolapsus Uteri—Falling of the womb.

Prophylactic—That which preserves or defends from disease; a preventive.

Proteids—Food composed of carbon, hydrogen, oxygen and nitrogen—as the white of an egg.

Proud Flesh—A fungus growth on an ulcer, or an excrescence of flesh in a wound from excessive granulation.

Pulmonary—Relating to the lungs.

Pupil—The circular opening in the colored curtain within the eye.

Purgative—A medicine that operates strongly in evacuating the bowels.

Pus—The matter discharged from a tumor when lanced, or from a sore. Healthy pus is yellowish-white in color, and is always secreted in the process of healing.

Putrefaction—The process of decomposition; state of corruption; rotteness.

Pylorus—The lower orifice of the stomach on its right side, through which the food passes to the intestines.

Quickening—The time when the motion of the fœtus within the womb is first perceptible.

Quittor—An ulcerous formation, resembling fistula, inside a horse's foot.

Rabies—Madness; hydrophobia.

Rales—The noise produced by air passing through the mucus of the lungs.

Ramify—Branched; running in various directions.

Raphe—A seam or suture.

Rectum—The last intestine; the anal gut.

Reflux—In medicine, the return of the blood from the head, or from toward the extremities, to the heart.

Refrigerants—Medicines or lotions that diminish heat.

Regurgitate—To throw or pour back; to swallow again.

Remittent—Ceasing for a time, as a fever or a pain.

Reproduction—The act or process of producing the young; breeding.

Resolution—The disappearance of inflammation without suppuration.

Resolvent—A medicine or substance, that will scatter inflammatory or other tumors, and prevent their suppuration.

Respiratory Murmur—The murmur which, when the ear is applied to the chest, is heard in the lungs, and attending the act of breathing.

Retention—A stopping or withholding, as retention of the urine.

Retina—The expansion of the optic nerve in the back part of the eye, on which the image is formed in the act of seeing.

Retrocession—Change of an eruption from the surface, to the inner parts.

Roaring—A disease or constriction of the wind-pipe, producing a roaring sound in breathing.

Rumination—The act of chewing the cud.

Rupture—The common name for hernia. The act of breaking or bursting, or state resulting therefrom.

Saccharine—Containing or having the qualities of sugar.

Saline—Containing salt in solution; salty.

Saliva—The secretion of the glands of the mouth, which moistens the food in chewing, and keeps the mouth and tongue moist.

Sallenders—The same as mallenders, except that it occurs in the flexures of the hock.

Sanitary—Relating to the preservation of health; tending to health.

Sarcoma—A fleshy tumor.

Scaphoid—Shaped like a boat, as the navicular bone.

Scapula—The shoulder-blade.

Sclerotic—The thick, hard, white, outer coat of the eye.

Sciatica—A rheumatic or neuralgic affection of the hip.

Scrotum—The bag which contains the testicles.

Sebaceous Glands—The oil tubes of the skin.

Secretion—The separation of various substances from the blood.

Sedatives—Soothing medicines; remedies that depress nervous power, or lower circulation.

Semen—The male generative product secreted in the testicles.

Septic—Causing or promoting putrefaction. Antiseptic: arresting putrefaction.

Septicæmia—Blood poisoning; usually an absorption.

Serum—The yellowish, watery portion of the blood remaining after coagulation.

Seton—An artificial passage under the skin, made by a seton needle, and kept open with tape, silk, or the like, which is drawn in, and is moved back and forth daily to keep up an irritation, with a view of setting up inflammation.

Sialogogue—A medicine that promotes a flow of saliva.

Sinus—An orifice or canal containing pus or matter.

Slough (pronounced sluff)—To fall away, separate from, as in disease, or in mortified parts.

Soporific—A medicine that induces sleep.

Spasm—A sudden, involuntary contraction of the muscles; a convulsion.

Spinal—Relating to the spine, or backbone.

Splint—An excrescence on the cannon bone of a horse. Splint bone: one of the bones of a horse's leg.

Spleen—A livid-colored organ attached to the stomach, the office of which is not well understood.

Spontaneous—Occurring without any apparent cause from without.

Sporadic—Separated, scattered; occurring here and there, as sporadic cases of disease.

Sternum—The breast bone, situated in the fore part of the thorax.

Stomachics—Medicines that promote digestion.

Strangulated—Choked; having the circulation stopped in any part.

Strangury—The stopping of a passage; generally applied to urinary organs.

Stricture—Stopping, or obstruction of a passage of the body, by morbid, or spasmodic, action.

Styptic—An astringent; having the property of stopping bleeding.

Sudorific—A medicine that will cause sweating, or perspiration.

Suppuration—The process of forming pus, or matter; the result of inflammation in an abscess, or a wound.

Suture—A stitch, or fastening, for joining edges of wounds. The seam or joint which unites the bones of the skull.

Synovia—A fluid resembling the white of an egg, secreted by the joints, and articulations, which it lubricates and keeps in healthful condition – joint oil, so called.

Tænia—Literally a fillet, or band. The technical name of the tapeworm.

Tapping—Drawing off collected fluid.

Tarsus—The cartilage toward the edge of each eyelid, giving it shape and firmness. The hock joint of the horse.

Tendon—The dense, fibrous structure in which a muscle ends, and by which it is joined to the bone.

Tent—In medicine, a pledget, or plug, introduced into a wound.

Tenuity—The property of being thin; small; rarefied.

Tetanus—A disease in which the voluntary muscles are spasmodically, but persistently, contracted, causing rigidity of the parts affected. When in the face it is called lockjaw.

Therapeutics—That part of medicine that relates to discovery and application of remedies for diseases. The use of diet and medicines.

Thorax—The chest, or that part of the body between the neck and abdomen.

Thrush—Ulceration of the cleft of the frog, and extending over the whole of it, with a discharge of fetid matter. A disease of the mouth.

Tibia—The large bone of the hind leg of a horse above the hock joint.

Tonics—Remedies which gradually and permanently improve the system.

Tonsil—An oblong gland situated on each side the fauces, terminated by the larynx and pharynx at the rear of the mouth, and having excretory ducts opening into the mouth.

Torsion—The act of twisting and turning, as in drawing a tooth with the turnkey.

Tourniquet—An instrument to arrest bleeding.

Trachea—The windpipe.

Tractile—Capable of being drawn out.

Transfusion—The introducing of blood from one living being to another.

Transudation—Passage of liquid through the tissues of the body.

Traumatic—Relating to a wound or injury.

Trephining—An operation to perforate the skull with a trepan, in order to remove a piece of bone.

Trichina Spiralis—A mite which burrows in the muscles, and which before becoming encysted, sometimes cause the death of the animal. They are principally generated in swine, fowls, rats, and other omniverous feeders.

Tubercle—A small tumor, as tubercle of the lungs.

Tympanum—The drum of the ear.

Ulna—The larger of the two bones of the fore arm.

Umbilicus—The navel.

Unciform—Curved or crooked, as a clam or finger nail.

Urea—A constituent of the urine. It is white, transparent, and crystallizable.

Ureter—One of the two canals or ducts, which convey the urine from the kidneys to the bladder.

Urethra—The canal leading from the bladder outward.

Urinary—Pertaining to the urine.

Urine—The saline secretion of the kidneys.

Uterus—The womb.

Vagina—The canal in female animals, from the vulva to the uterus.

Varicose Veins—Veins, generally in the legs, which are permanently dilated, knotted and irregular.

Vascular—Pertaining to the vessels of animal and vegetable bodies, as vascular functions. The arteries, veins, lacteals, and the like, compose the vascular system. Animal flesh is vascular.

Venesection—Letting blood by opening a vein.

Venous—Pertaining to the veins, or contained in veins.

Ventral—Pertaining to the abdomen or belly.

Ventricles—The posterior chambers of the heart.

Vermicular—Worm-like in shape or appearance.

Vermifuge—A medicine or agent that destroys or expels worms.

Vertebra—A division, or separate bone, of the spinal column.

Vesicle—A small blister.

Villi—Minute, thread-like projections. The inner mucous membrane of the stomach and intestines is called the "villous" coat, from its abounding in villi or minute projections.

Virulent—Dangerous, or malignant; as a virulent type of disease.

Virus—Contagious, or poisonous matter.

Viscera—The organs contained within the cavities of the body, particularly of the head, chest, and abdomen.

Viscid—Sticky, or tenacious, with a glutinous consistency.

Vivisection—The dissection of, or cutting into, living animals.

Volatile—Giving off vapor, flying off in vapor.

Vulva—The outer opening, in female animals, of the generative parts.

Warbles—Tumors caused by the depositing of the eggs of the gad-fly in the backs of cattle. Also small, hard tumors on the backs of horses from the irritation of the saddle.

Wen—A distinctly defined tumor under the skin, seldom hurtful. An encysted tumor.

Wind-galls—A distension of the synovial membranes of a horse's fetlock joints.

Womb—The uterus, or pouch, in which the young are carried in the fetal stage before birth.

Xiphoid—Sword-like—A small cartilage at the bottom of the breast bone.

Zoology—That part of natural history which treats of the structure, habits, classification, and habitations of animals.

Zoon—An animal; having animal life.

Zootomy—Dissection of the lower animal.

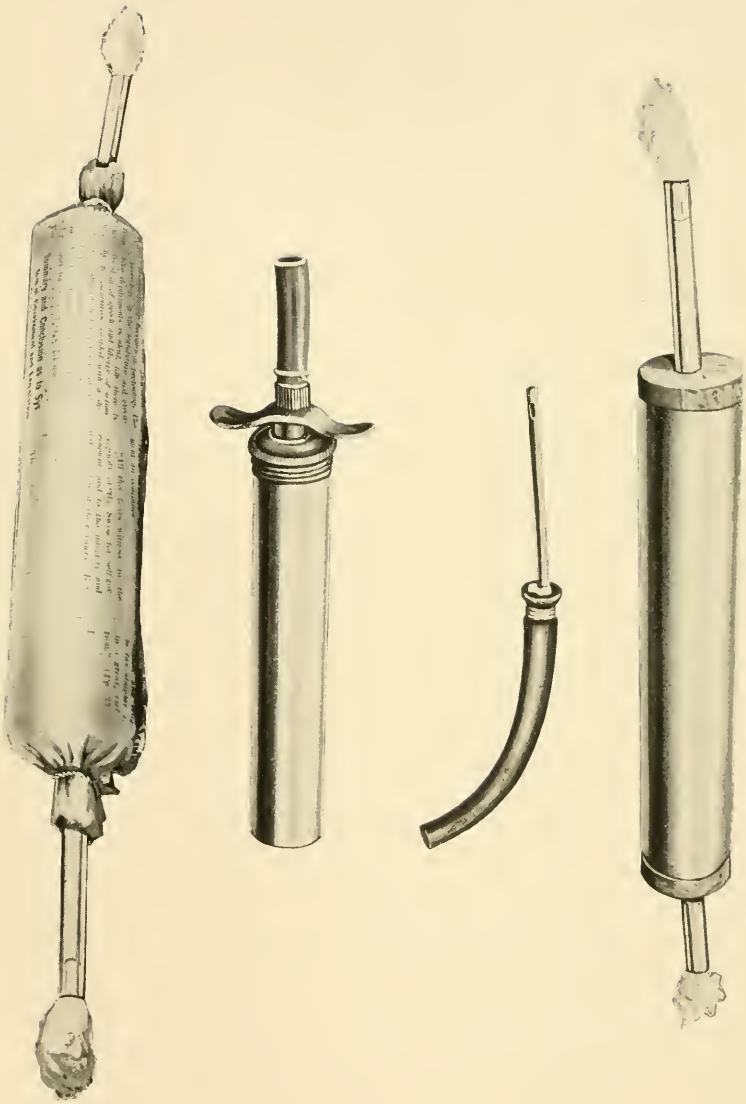
Zygomatic—Pertaining to the cheek bone, or to the bony arch under which the temporal muscle passes. From zygoma, the cheek-bone.

Zymotic—Caused by, or pertaining to fermentation; as a zymotic disease, being one in which some morbific principle acts on the system like a ferment.

ADDENDA

MILK FEVER.—Since writing the first article on milk fever, the statement has been made that filling the udder with sterilized air is as effectual a treatment as either the oxygen or Schmidt treatments; if this be true, and there are many reasons for believing that it is, the treatment of this dreaded disease becomes very simple. The air pumped into the udder must first be freed from germs, and this can be done by pumping it through sterilized cotton. A simple and yet effectual apparatus can be made as follows: Get a tinner to make a tin tube six inches long and one inch in diameter, have the seam pressed and use as little solder as possible; or better yet, if it can be obtained, is a piece of steel bicycle tubing the same size; this can generally be had at a bicycle repair shop; have a druggist fit each end of the tube with a cork, having through it a small piece of glass tubing, as shown in the cut; have the corks fit tightly; fill the large tube just nicely full with a fine grade of cotton batting or with absorbent cotton, which can be had at any drug store, and the apparatus is complete. There is also needed a milking tube with a short piece of rubber tube attached, and a small bicycle pump.

Before using the apparatus it must be sterilized; put a little cotton plug in the end of each of the glass tubes, as shown in the cut, and roll the tube in four or five layers of newspapers, tying the ends around the glass tubes, as shown in the cut, and it is ready to be sterilized. To sterilize it, put in an oven with a slow heat, about right for baking cake, and leave it there for one hour; the oven should be hot enough to just slightly scorch the paper, and turn the cotton plugs in the glass tubes just a little brown; if too hot, the cotton inside the tube will be burned too much, but the cotton plugs and the paper will indicate the amount of heat to use. The tube is now ready for use, and by pumping air through this sterilized cotton, the germs will be filtered from it. The apparatus can be sterilized and laid away,



APPARATUS USED IN STERILIZED AIR TREATMENT FOR MILK FEVER.

leaving the paper around it, in some clean place, and it will be all right for use when needed; it would be best to re-sterilize if not used for three weeks after sterilizing.

To use in treating the cow, put the milking tube, with the piece of rubber tubing attached, into a solution of: Carbolic Acid, ½ ounce; water, 1 pint, to sterilize it; remove the cotton plug from one of the glass tubes and attach the bicycle pump by means of a short piece of rubber tubing; remove the cotton plug from the other glass tube and attach the milking tube, first shaking all the Carbolic Acid lotion from it; wash off the end of one of the teats with the Carbolic lotion, and insert the milking tube into it and pump air in slowly. If pumped too fast, germs may be forced through the cotton. Be sure the milking tube does not touch anything after it comes from the solution before it enters the teat; it can be dipped into the Carbolic solution just before introducing it, if the apparatus is held with the tube end down, so that the cotton inside the large tube cannot get wet; this must be kept perfectly dry, or it will not sterilize the air. After pumping into a quarter all it will hold, remove the milking tube and take a small bandage about one inch wide, and commencing at the bottom of the teat, bandage the teat tightly to close the duct and prevent the air from escaping. The bandage is safer than a string tied around the teat. Treat each quarter the same. Wet the milking tube in the Carbolic lotion each time before putting it into a teat, being careful not to let the cotton get wet. After filling the udder, knead gently. After six or eight hours the air could be worked out and the udder refilled with fresh air, if necessary. With this treatment the cow should receive the same general treatment as given with the first article.

The apparatus may require new corks, and also to be refilled with fresh cotton, after it has been sterilized a number of times.

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